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# Contractors and Engineers Monthly

Vol. 39, No. 9

SEPTEMBER, 1942

\$2 a Year, 20 Cents a Copy

## Highlights Of This Issue

### • Roads to Aid War Effort

Road-building is now being concentrated on those highways necessary to the war effort. In this issue are articles on a much-needed highway improvement on an access road to a Navy Yard, to overcome a complicated traffic condition; on a hot-mix road job in Ontario, improving the route leading to vital Canadian war industries; and on the Alaska Highway, so important to our war effort. See pages 1, 18 and 36.

### • Airport Construction

Asphalt paving of base and top on airport runways on a contract for the expansion of a southern airport and an innovation in soil-cement base stabilization for airport runways through the use of metered spreading of bulk cement at a western airport are described in this issue. See pages 2 and 38.

### • New Tunnel Approach

The second tube of the Lincoln Tunnel between New Jersey and New York City, the first tube of which was opened in 1937, needed to take care of the ever-increasing vehicular traffic into New York, is now practically finished, with the work progressing rapidly on the Manhattan approaches. A description of the latter phase of the work appears in this issue. See page 2.

### • Salt for Ice Control

The use of sodium chloride for ice control on New Hampshire highways is described in this issue, with an interesting comparison of the costs of former methods of extensive sanding and the new method of melting the snow before it forms ice. See page 12.

### • Flood Wall in Tight Quarters

Another article in our series on U. S. Engineer Department flood-control projects describes the construction of a concrete flood wall, the feature of which was the way in which the contractor solved the problem of very limited working space. See page 15.

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Sam Schmidt lubricating crane cable.

## Crane Operator Talks About Wire Rope Use

Sam Schmidt Has Handled Various Types of Machines for Kaw Paving Co., Topeka, Kans., for 18 Years

† EIGHTEEN years ago Samuel Schmidt went to work for the Kaw Paving Co. of Topeka, Kansas, as a crane operator. Except for a few vacations, he has operated the same type of crane for the same company continuously ever since.

Eight years ago all of their equipment was checked by an engineer and a wire rope factory representative. As a result of this check-up, a change to preformed rope was made in all cases where the new type was recommended. But let Sam Schmidt tell you the story in his own way:

"At first I thought little about the switch but as I became acquainted with preformed, I found that there was just

(Concluded on page 10)

## Needed Access Road Connects Navy Yard With Two Highways

(Photos on page 52)

† AN access road project of unusual interest because of its method of solving a very complicated traffic condition was built this past summer by the Guerini Construction Co. of Mattapan, Mass., for the Maine State Highway Department to serve the Kittery, Me., Navy Yard. This Yard, like all others on our coasts, has increased in importance, with rapid concentration of highway traffic as a result. The U. S. 1 by-pass around Portsmouth, N. H., serves the Navy Yard as does the older location of U. S. 1.

To solve this, Maine has built a relief highway from the Navy Yard to U. S. 1 where an elliptical traffic "circle" permits vehicles to reach U. S. 1 by-pass and U. S. 1 in either direction or to leave via an existing state-aid road. This is accomplished for the state-aid road and U. S. 1 by the use of the traffic circle alone, while traffic proceeding beyond Portsmouth on the by-pass will use a new underpass and then proceed via a single-loop clover leaf. All roads are one way as they enter or leave the traffic circle.

### Underpass Construction

The by-pass is on a relatively high fill at the point where the underpass was built. This necessitated excavation to a depth of only 9 feet below ground level to permit a clearance of 14 feet between the finished roadway surface and the bottom of the underpass structure. In order to permit operation of the 1½-yard Lorain diesel-powered shovel, it was necessary to lay down a gravel fill about 2 feet thick across the

## Traffic Jam on Old Narrow Roads in New England Is Overcome by Underpass and Traffic Circle, Wider Road

area between U. S. 1 and the by-pass for the operation of the shovel and trucks.

The by-pass was completed only two years ago and consists of two 11-foot lanes of reinforced concrete in each direction separated by a boulevard strip 8 feet wide. Traffic was detoured around the underpass construction on a temporary gravel surface road to the west of the by-pass and this was used by both north and southbound traffic. The location of the underpass is such that two 50-foot slabs of concrete had to be removed in each of the four lanes so that all excavation was open cut and did not necessitate any construction beneath the existing pavement.

Earth excavation for the underpass amounted to 3,400 cubic yards with an additional 1,700 cubic yards of rock excavation. The underpass is of rigid-frame construction, requiring 685 cubic yards of concrete with 94,000 pounds of reinforcing steel. There is a total of 210 feet of concrete hand-rail at the top of the underpass and 230 cubic yards of concrete in the retaining walls.

### The Traffic Circle

The traffic circle is an ellipse with the two centers 50.4 feet apart and with radii of 130 and 120.72 feet, making it approximately 300 feet long and 260 feet wide inside diameter surrounded by a roadway which varies in width from 22 to 30 feet, depending on the expected traffic in the various sectors. Each traffic lane entering or leaving the circle is divided from the adjacent lane by a traffic divider, triangular in shape. All traffic enters and leaves the circle on curves, the minimum radius of which is 100 feet.

These entering roads, the traffic circle itself, and the three roadways permitting traffic to enter or leave the by-pass contain so many curves and spirals that enough stakes were required by the surveying party laying them out to take care of 6 miles of ordinary road, instead of the nominal 1.6 miles involved in this entire project.

### Pavement Types

All paving in the circle and spurs is bituminous concrete while the roadway to the Navy Yard is bituminous macad-

(Continued on page 40)

## SPEEDING WORK ON A SOIL-CEMENT RUNWAY BASE



Metered spreading of bulk cement from 600-bag capacity semi-trailers at a western airport greatly increased the speed of construction and the accuracy of the soil-cement mix. See page 38.



# Manhattan Approach To Lincoln Tunnel

## Need for Service of Second Tube Leads to Completion Of Plaza in New York City For Westbound Traffic

✦ SUBAQUEOUS tunnels serve New York City for both railroad and vehicular traffic. The ever-increasing vehicular traffic from New Jersey into the city led to the completion and placing in service of the first of the pair of tubes of the Lincoln Tunnel in 1937. The second tunnel is now completed except for the tile lining, electrical installations, ventilation equipment and approaches. At the New Jersey end the approaches are complete and work is progressing rapidly on the Manhattan approaches and on two ventilation buildings and equipment, with an A-2 priority as a national defense measure.

A portion of the new Manhattan Plaza for the westbound tunnel is formed by decking over the newly depressed freight tracks of the New York Central Railroad between Tenth and Eleventh Avenues, and between 39th and 40th Streets. By removing the south parapet of the 40th Street bridge over the tracks and the north parapet of the 39th Street bridge, access to the plaza from these streets is provided. The plaza section over the tracks is supported by twelve rows of columns arranged in five lines and spaced irregularly to take advantage of the track and switch spacing.

The Port of New York Authority awarded two contracts, MHT 55 and 56, for the construction of the Manhattan Plaza to the George J. Atwell Foundation Co. of New York City. Contract 55 for the plaza and steel-bent section is a cost-plus-a-fee contract with a fee which can not be reduced below 3 per cent but may be as high as 9 per cent of the contract, depending upon a comparison of the final cost with the cost based on bid prices. Contract 56 for the plaza section over the New York Central tracks is on a cost-plus-a-fixed-fee basis.

### Work in Railroad Cut

The contractor is well acquainted with the character of the rock in this section as he also had the contract for depressing the New York Central freight tracks. The rock is Manhattan schist and some granite (aplitic pegmatite). Portions of both the west and east sides of the railroad cut had to be trimmed from 1 to 3 feet by line drilling and plug and feather to accommodate a small wall. Behind this wall, rock backfill was placed to take care of surface and seepage water. The railroad at first would not permit the use of explosives in this section because of possible damage to the third-rail system. Later permission was obtained to use explosives in the

column-footing excavation. Only light charges were used.

### Concrete Approach Walls

The concrete approach walls in the plaza vary from 7 feet to 16 feet 6 inches in height and are 1 foot 11 inches thick at the top with a vertical back and the front battered  $\frac{1}{4}$  inch to 1 inch. Graduated stone was placed back of all walls above a 2-foot layer of bank-run gravel at the heel of the wall footing. A 12-inch vitrified-clay pipe laid with open joints was placed in the gravel to serve as a wall drain. Metal channels were placed in the concrete walls to accommodate anchor ties for the brick facing. The plywood panel forms for the walls were built in 6-foot widths and had  $\frac{3}{16}$ -inch diameter wires stapled on 3-inch centers to the inside face to roughen the poured wall. This provides a bond between the mortar at the back of the future brick facing and the concrete wall.

### Concreting

The rock was exceedingly irregular in profile along the steel-bent section. Some low spots in the final rock sections had to be provided with drains during construction because of water seepage into pockets. This was removed by double diaphragm pumps. However, water was not a big problem in the work.

All concrete, with the exception of the roadway slab, is designed for 3,000-pound strength, and the roadway and ceiling slabs are of 4,000-pound con-



C. & E. M. Photo

Excavation for column footings on the west side of the railroad cut, using jackhammers, plug and feather, and hand shoveling.

crete. With the exception of the protection concrete, all concrete is reinforced. A 4-inch invert protection base for the application of waterproofing was placed at the bottom of the steel-bent section. Four-inch concrete sand walls are provided at the vertical sides of the structure.

Waterproofing consists of two layers  
(Continued on page 16)

# Asphalt Base and Top For Airport Runways

## Hot-Mix Cold-Laid Base and Asphaltic Limestone Top; Initial Contract Extended At Southern Airport

✦ A MUNICIPAL airport in the south originally consisted of 217 acres with three graded and sodded runways 500 feet wide and 3,600 feet long. Plans were under consideration by the city for paving the runways when the airport was designated for enlargement and paving of the runways 3,500 x 100 feet by the CAA.

The contract for the work included grading and paving with an asphaltic-concrete binder course sealed with an asphaltic-limestone top. Later the contract was extended to pave two of the runways 4,000 feet long and 150 feet wide and the third runway 3,500 feet x 150 feet, using hot mix from a plant erected near the airport, because of the

lateness of the year, and sealing with a hot-mix sand-asphaltic limestone mixture made up of two parts asphaltic limestone to one part sand. The airport area was increased 50 acres to 267 acres, contact lights placed along all runways, and the boundary-light system extended.

### Base and Drainage

The excavation for the base of the runways was done by an elevating grader and a  $\frac{1}{2}$ -yard shovel working in the borrow pit. Four inches of the existing material in the runways was mixed with an added 4 inches of sand-clay, and then the top 4 inches of this had 100 pounds of gravel per square yard mixed in to stabilize the base. After rolling, this was primed, at first with 0.25 gallon per square yard of tar, later increased to 0.3 gallon, and allowed to cure a minimum of three days and actually up to three weeks. During all of this construction, the airport was nominally closed, but some planes occasionally used an area reserved for emergency and limited flying.

Drainage tile was laid from 2 to 4 feet deep, depending on the grade, with a coarse gravel cover and butt joints. The same type of tile, in 8 and 24-inch sizes, was used for surface drainage through the twelve catch basins, and also for seepage water because of the lag of several hours between the surface and seepage flows after a heavy rain.

### Binder Course

A binder course of asphaltic concrete  $1\frac{1}{2}$  inches thick was laid on the stabilized base. This material was mixed hot at Tuskegee, Ala., with an excess of flux, and was en route from three to four days. The material set up so hard, due to cooling and vibration, that it had to be removed from the cars by a power  
(Concluded on page 43)

# Road-Mix Surface In Macon County

## Program for Increasing Bituminous Surfacing of County Roads Included Cut- Back and Powdered Asphalt

✦ ROAD-MIX retread using new aggregate and SC-3 asphalt in Macon County, Illinois, costs but 30 cents per square yard and seemed to be the solution of the county's problem of providing dustless, mudless roads around Decatur, the county seat, and for the more heavily traveled connecting roads throughout the county.

Decatur is located in the center of the county with highways radiating to the cardinal points and the four corners, and county highways connecting the state routes through the villages and communities. This has influenced the construction and maintenance program to a considerable extent. Snow removal centers at Decatur where the Central Garage is located in a large building provided at the County Farm.

Macon County is in about the geographical center of Illinois and in the middle of a large corn and soy bean belt. While the soil is well adapted for farm purposes, it requires much manipulation and added improvements for road bases. The county is fortunate in having a considerable local gravel supply as the Sangamon River crosses the county and there is considerable gravel along this river which is adaptable to road purposes after a certain amount of crushing and screening.

Four years ago there was established the Decatur Regional Planning Commission. Alan N. Buck, the County Superintendent of Highways, has been a member of this commission since its beginning, and Macon County roads are being developed from studies that were made with this long-term planning survey. In other words, Macon County has not built new roads on a hit-or-miss system, and where a road improvement took place there was ample justification from the results of this planning report and the Commission's approval.

### Road-Mix Methods

The original surface on all county roads is traffic-bound gravel. When an oil mat surface, usually of 2-inch thickness, is added, it is always road-mixed. The new surfacing program starts with a 20-foot base having about 2 inches of compacted gravel. The base is shaped to cross section with a  $\frac{1}{2}$ -inch per foot crown. Then the shoulders are stripped to the base of the sod, this material being laid out on the slope toward the ditch.

For an 18-foot road about  $4\frac{1}{2}$  cubic feet of graded gravel per foot of road is brought in and windrowed on one shoulder. A rotary sweeper is then used to clean the surface of the road which is immediately primed with SC-2 at the  
(Continued on page 24)



C. & E. M. Photo

The contractor's compressor outfit and one of the Kadco dust collectors used on the Manhattan plaza and approach to the Lincoln Tunnel, New York City.



An Adams Retread Paver mixing a 3-inch mat on a Macon County road.



## Rhode Island paves with both types

Above is a TEXACO Sheet Asphalt pavement on Pawtucket Avenue, East Providence, R. I.

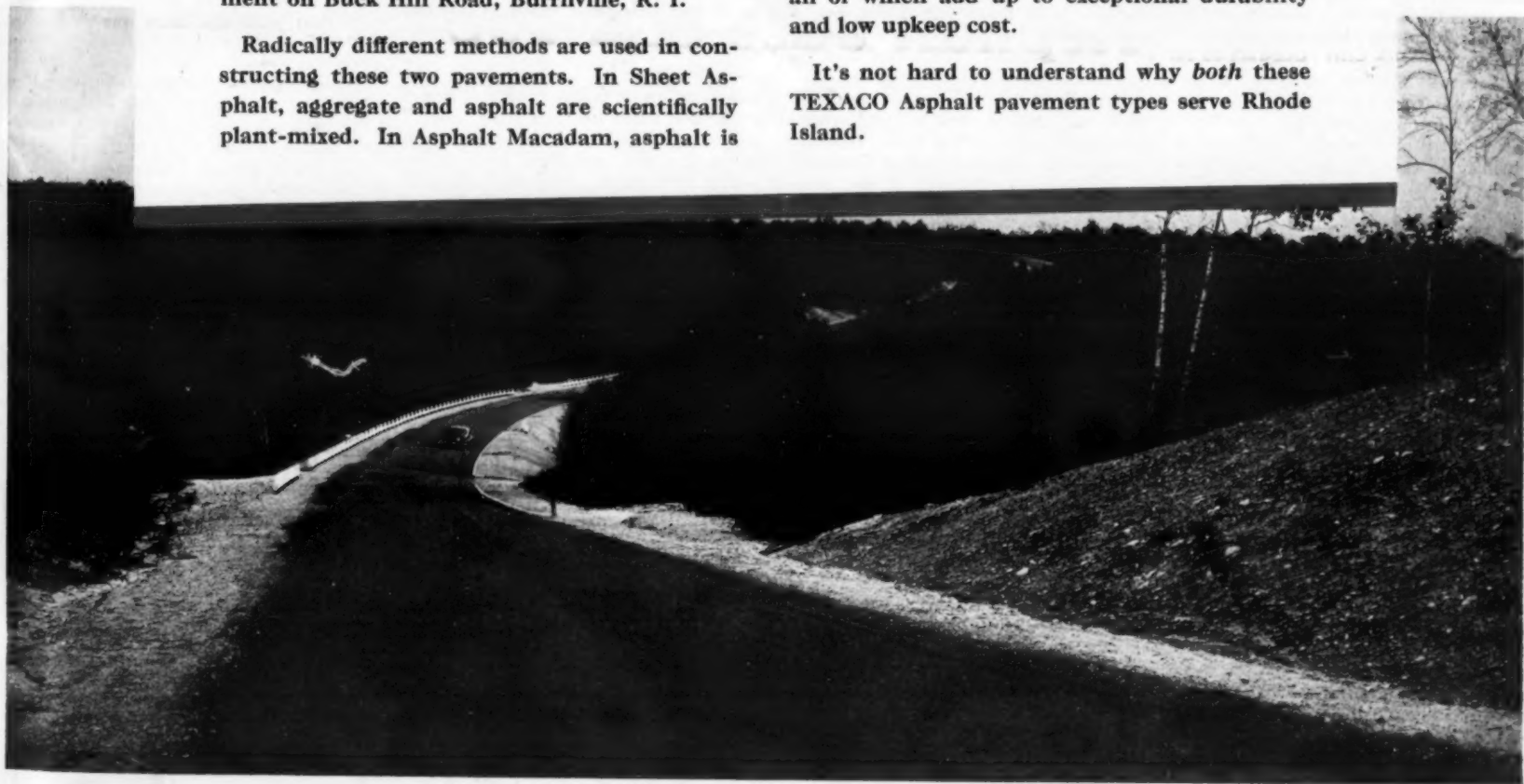
Below is a TEXACO Asphalt Macadam pavement on Buck Hill Road, Burrilville, R. I.

Radically different methods are used in constructing these two pavements. In Sheet Asphalt, aggregate and asphalt are scientifically plant-mixed. In Asphalt Macadam, asphalt is

forced into the pavement by pressure distributor.

But, despite the wide difference in construction methods, the two pavements have certain important qualities in common . . . life-prolonging resilience under impact . . . freedom from joints . . . imperviousness to moisture . . . low susceptibility to temperature change . . . all of which add up to exceptional durability and low upkeep cost.

It's not hard to understand why *both* these TEXACO Asphalt pavement types serve Rhode Island.



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# Contractors and Engineers Monthly

THE NATIONAL BUSINESS PAPER FOR CIVIL ENGINEERING  
CONTRACTORS AND HIGHWAY ENGINEERS AND COMMISSIONERS

Member of Controlled Circulation Audit

Issued Monthly by Buttenheim-Dix Publishing Corp.  
Editorial and Business Office: 470 Fourth Ave., New York City  
Printed in Mount Morris, Ill., U. S. A.

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## Patriotism—Deeds, Not Words

Patriotism is not just waving the Flag, sending a boy into service, or bitterly hating the enemy. It can be something big in an economic way, such as the sacrifices of an individual to buy War Stamps and Bonds, and conserving tires so that the Armed Forces can have them this year and next and the next.

We are gratified to publicize one outstanding patriotic service rendered by a contractor which came to our attention recently. This contractor had been building a group of warehouses of reinforced concrete of a special design for which he developed unusual equipment which greatly speeded the work—put it on a production basis. When the first and second contracts for groups of these warehouses were completed, the War Department felt that it was necessary to cut costs in order to insure an added million square feet of warehouse capacity with the money remaining in the budget and decided to build of wood instead of reinforced concrete.

The contractor then did considerable figuring and study, with the result that

an offer was made to the War Department to build the remaining warehouses of reinforced concrete for the sum budgeted for the wooden structures, provided that the steel reinforcing could be secured under a reasonable preference rating. This was arranged and the work order issued.

How could the contractor make such an outstanding offer? First, the contractor, an able constructing organization, is patriotic and sincerely wanted to make a contribution to the war effort beyond its mere skill. Second, this firm, like all others with a successful history, knows its costs and bids accordingly. Having built two sections of warehouses already, the cost of the special equipment, forms and devices had been written off. With those out of the way, it was possible to build the remaining structures at a much lower cost, and the contractor himself made the offer.

In this way the Government has profited by the patriotic zeal of the Corbetta Construction Co. of New York. Hats off, Construction Industry, salute Corbetta!

## There's No Such Word as "Can't"

Speaking of patriotism and contractors, the New York *World-Telegram* recently carried an editorial which began, "The writer of this editorial saw the July 4 launching of the first victory ship to go down the ways at the Henry J. Kaiser yard at Vancouver—6,000,000 pounds of steel sliding into the water from a spot which six months before had been a marsh and dairy farm."

"Around the scene everything was white and shining, nothing like the usual old-time black and grimy shipyard. No modern factory presents a cleaner and more inspiring sight, which, by the way, means much in the morale of the thousands of workmen who sat on the beams and cranes and cheered their creation as it went to its great adventure. To those workmen the Kaiser company in its booklet for the occasion gave the credit for two world records—one, making ready the yard in 85 days; second, building the ship in 80 days, 25 days better than the best time up to then for any maritime yard." (And incidentally, Kaiser has since then lopped off so much time and established so many new records that it is practically impossible to report the latest, for by the time the "latest" gets into print, there's a new one.)

The editorial goes on to point out that back of this streamlined mass-production shipbuilding are Boulder, Bonneville and Grand Coulee Dams, and all manner of other Kaiser-built projects, many once classified as things that couldn't be done.

"And now Kaiser wants to build giant cargo planes, the general idea being that since we're in an air age maybe we'd

better get out of the water, use at least some of the materials we are now putting into ships and turn them into air fleets. . . . So we think he ought to be given his head . . . For this war has come to a pass where we'd better be open-minded toward the new, instead of suffering from too much reverence for the old. In short, we'd better be willing to try anything once, especially when the one who proposes it has the record of successful accomplishment that Henry J. Kaiser has hung up for himself."

The question of air vs. sea transport is not exactly in the province of CONTRACTORS AND ENGINEERS MONTHLY, but we, as patriotic Americans, can not fail to be proud of the achievements of an American business man who seems to typify the best of American ingenuity, enterprise and the capacity for getting things done. As a part of the civil-engineering construction industry, we are proud that a member of that industry has already made so great a contribution to the nation and to Victory, and venture to predict that he has only just started.

This natural-born builder had never seen a ship launched until a year before Pearl Harbor. But by the same direct attack on the problem and by following the same type of procedure in organization and methods which achieved great construction records, he has made ship-building history, and can go on to making airplane history, if the die-hards will let him.

And so we salute still another member of the construction industry, for whom the word "can't" just does not exist.

## Maine Road Program Revised and Reduced

A revised program for the current fiscal year ending June 30, 1943, has been prepared by the Maine State Highway Commission and submitted to the Governor and Executive Council. This new program indicates the curtailment of activities necessitated by the effects of gasoline and tire rationing upon the income to be received from gasoline tax and motor vehicle license fees.

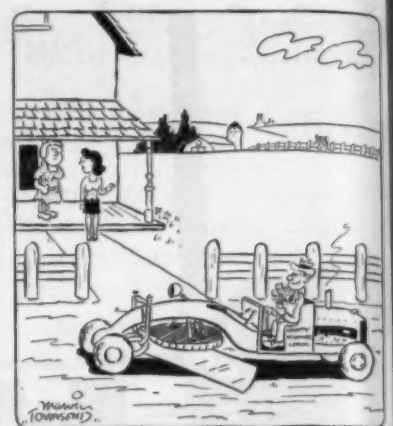
According to a report in the *Nerba*, Maine's planned expenditures for the current year have been cut from \$11,137,463 to \$6,492,463, a reduction of \$4,645,000. The revised program calls for no road construction, except that provided for in legislative resolves, and \$200,000 set up for construction of bridges under the Bridge Act. Reasonable but curtailed maintenance is planned.

Some of the larger eliminated items were: \$885,000 for the construction of state-aid roads; \$670,000 for construction of third-class highways; \$425,000 to match Federal Aid for secondary roads and military highways; \$300,000 for bituminous surface treatments on state and state-aid systems; \$200,000 for maintenance of unimproved roads; \$300,000 for construction and reconstruction of state highways not in the Federal system; and \$600,000 conditionally provided for construction or improvement in the Federal-Aid system.

## Post-War Planning For Urban Traffic

One of the great problems yet to be solved is for that vast amount of traffic that originates within the corporate limits of our cities and wants to flow uninterrupted to suburban destinations. Similarly there has been little constructive thought, and far less actual construction, given to the great volume of traffic that wants to by-pass our cities in its journey from one metropolitan center to another, and finds its way impeded by smaller communities through which the traffic must pass and tangle with local vehicles.

A pictorial study of this problem was made by the Landscape Division of the Texas Highway Department in its customary manner of stating the problem in a few words and showing how it may be solved by a series of sketches which can be used as the basis of designs by the planning sections in the various dis-



tricts. This 24-page pamphlet was made available to the district engineers early in 1942 so that, as the time and personnel available make it possible, studies can be made throughout the state to determine where there can be improvements in through-traffic routes for after-war construction.

In addition to the actual study of by-passing traffic, it discusses pictorially the planning of orderly parking on through routes, and the development of urban arteries. The illustrations show methods of spreading the highway traffic into various arteries as it approaches the city, to give access to the outlying sections of the city and to permit easy flow on broad, uncrowded streets rather than converging traffic to the congested business center. The treatment of a by-pass system to prevent by-pass routes becoming built-up suburban streets is shown in sketches depicting the good and bad methods and their results. Coupling the construction and design of a by-pass with good community and regional planning makes for the best results for traffic and the values of properties within and outside the corporate limits, stabilizing values for the protection of all.

A few copies of these pamphlets are still available from the Texas Highway Department by applying to Jac L. Gubels, Head, Roadside Development, Landscape Division, Texas Highway Department, Austin, Texas.

*It takes about half a ton of scrap to produce a ton of new steel for the weapons of war. Do your share by turning in your old scrap at once.*

## DON'T LET THE ROLLER BOG DOWN





### "Duration Bands" Replace Worn-Out Pneumatic Tires

In a new folder on the French & Hecht line of steel wheels and other items to keep your equipment rolling in spite of the rubber shortage, attention is called particularly to the Duration Bands to replace worn-out pneumatic tires.

These bands come in halves and bolt over the drop center rim wheel of pneumatic-tired equipment such as wheelbarrows, buggies and carts, giving a

radius from axle to ground approximately equal to the axle-to-ground distance when the pneumatic tire is under load. While these Duration Bands can not give the cushioning effect of a rubber tire, they will keep your wheelbarrows or carts in service.

Further information on these Duration Bands, as well as on the line of steel wheelbarrow and cart wheels, trailer support wheels, and bearing protectors, is contained in literature which French & Hecht, Inc., Davenport, Iowa, will be glad to send on request.

### How to Get More Work Out of a Hand Shovel

With an average of six million shovels produced in the United States every year, any improvement in the efficiency of shovel users should result in accomplishing a tremendous additional amount of work. With this in mind, The Union Fork & Hoe Co., Columbus, Ohio, manufacturer of Razor-Back shovels, recently issued a new training folder entitled "How to Get More Work Out of a Shovel".

Fourteen practical tips for moving more material with less effort are presented by means of easily-understood drawings, showing the right and wrong ways to perform various shoveling operations and the most efficient type of shovel for each major class of work. The folder is intended for distribution to shovel users on all types of jobs, and for posting in plants and on construction and road work.

Copies may be obtained by writing direct to the manufacturer and mentioning this item.



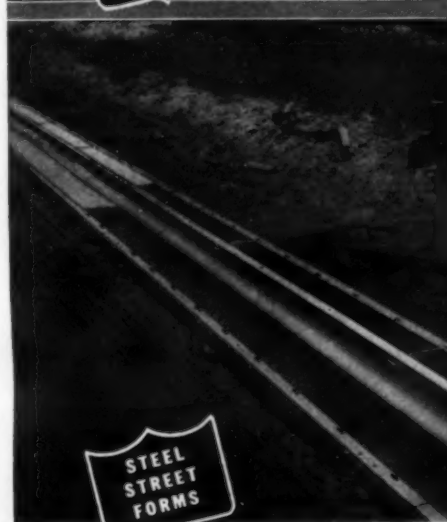
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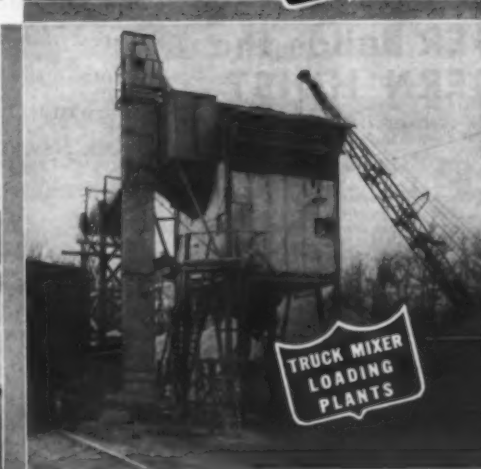
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TAMPING ROLLERS

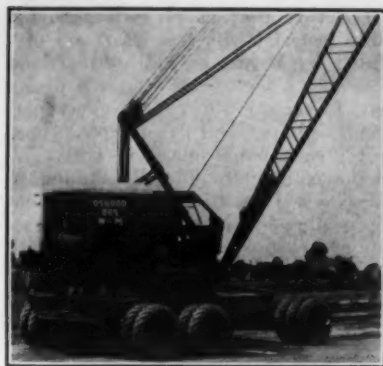


CONCRETE FINISHING MACHINES



TRUCK MIXER LOADING PLANTS





The new wide-gage Mobilcrane.

### New Wide-Gage Model Of Tire-Mounted Crane

The latest addition to the Osgood line of one-man one-engine-operated cranes mounted on pneumatic-tired wheels is the Model 805WM wide-gage Mobilcrane. Features of this new unit include independent travel, independent boom hoist, extra-wide chassis, eighteen rubber-tired wheels, hydraulic steering, and air brakes. All operating functions of the machine are controlled by air power.

The extra width of the chassis and use of twelve wheels at the rear and six in front make it possible to lift loads up to 30 tons over the side of the machine as well as the ends, and to carry the load to the desired location, the manufacturer states. The tandem rear-wheel-drive unit is arranged to oscillate up and down. This oscillation absorbs shock and keeps the machine level when traveling over rough or uneven ground. The front axle carries three wheels on each side, with the axle suspended in a saddle block, which allows it to oscillate vertically. Leveling jacks on either side of the frame over the axle may be applied to keep the machine on an even keel when operating.

The cab is of modern streamlined design, giving the operator full visibility at all times. The boom is available with variable-length inserts, and is equipped with a telescopic backstop which allows the boom to be lowered to the ground, and to be raised to its minimum safe working angle.

For use in narrow or confined quarters, the 805WM Mobilcrane is also available with a standard-width chassis and only twelve wheels. Stability is obtained through the use of jack arms, which fold up out of the way

when not in use.

An illustrated bulletin on this new Mobilcrane may be secured direct from the Osgood Co., Marion, Ohio, by mentioning this item, or from this magazine.

### Use of Hard-Facing Lengthens Tool Life

With critical materials becoming more and more critical, and the wear and tear on machines already in the field increasing daily, the importance of repair and extending the service life of those machines and tools increases also.

One means of accomplishing this is through the use of hard-facing welding rods for building up worn dipper teeth, grader blades, rolls and hammers in crushing equipment, tamps on sheep-foot rollers, and all other parts subjected to severe wear. This may be done before the equipment is worn down by protecting it from abrasion through the use of an overlay of hard-

facing material, or if the part is already worn, it can be repaired and rebuilt with such rods.

Coast Metals, Inc., 1232 Camden Ave., Canton, Ohio, makes a wide variety of hard-facing welding rods to provide resistance to abrasion and wear, resistance to impact and shock, high-temperature properties, and corrosion resistance. The rods are readily applied by the oxy-acetylene torch or the electric arc, and may be applied to any ferrous metal, including alloy steels, manganese steel, and cast and chilled irons. Where special properties are necessary, or a problem is not solved by the standard types of rods, Coast Metals technical staff will work with the operator to obtain the results desired.

Two folders, one on the Coast Metals line of hard-facing welding rods and the other on the use of its rods for maintaining equipment particularly subjected to abrasion, may be secured by interested contractors and engineers direct from the manufacturer by re-

ferring to this item, or from this magazine.

### Catalog on Equipment For Concrete Handling

Catalog No. 70, recently issued by Garlinghouse Brothers, 2416 East 16th St., Los Angeles, Calif., is devoted to its complete line of over 300 items of construction equipment for the handling and placing of concrete. Each of these products has been built to meet the specific needs of some construction operation and has been scientifically designed to do that job efficiently. The line includes all types of concrete hoppers, chutes, bin gates, concrete buckets, wheelbarrows, material dump carts, concrete carts, the Gar-Bro shovel-barrow, etc. Each piece of equipment is clearly illustrated and described, specifications are given and there are many action photographs.

Copies of this two-color catalog may be obtained by writing direct to the manufacturer and mentioning this item.



**N**O MATTER how severe the conditions on construction jobs, you can count on longer, uninterrupted service from your wire rope... when you protect it with *Texaco Crater*.

*Texaco Crater* completely penetrates wire rope, preserving the core, coating each wire in a tough, viscous, lubricating film. It cuts down internal and external wear, seals out moisture, prolongs rope life.

The outstanding performance that has made *Texaco* preferred in the fields listed in the panel has made it preferred on prominent construction jobs throughout the country.

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Combined All-Steel Side Frames and Base (50% stronger, hundreds of pounds lighter), Smoother Power, Silent Chain Drive. Sizes 6 to 100 H.P., Gas or Electric, 1 to 3 Drums.



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THE JAEGER MACHINE CO  
701 Dublin Ave., Columbus, Ohio



# New Bridge for Old At Durand, Wisconsin

## New Steel I-Beam and Truss Structure Replaces the Old Narrow Bridge; Constructed By Fielding & Shepley

(Photo on page 52)

THE old narrow steel-truss bridge crossing the Chippewa River at Durand, Wisconsin, was built in 1902 from some used steel salvaged from a bridge in Montana. This past summer saw the wrecking of the old structure as the new steel I-beam and truss bridge entering the center of the city was completed and opened for traffic. The contractor, Fielding & Shepley, Inc., of St. Paul, Minn., maintained an increasing lead on the time schedule from the moment work began on the 425-calendar day contract which started January 21, 1941.

The usual gambling with the early spring and June high waters was mostly in favor of the contractor. The April freshet, when the ice went out, shut down work from April 8 to 12 inclusive and washed out the sand road which extended to Pier No. 6. The highest water was expected in June, but none occurred this year. A series of hydro and paper-mill dams above Eau Claire are quite effective in controlling minor freshets on this river.

### The Bridge Structure

Foundation conditions were very favorable for the structure, every unit of which, except the west abutment, rests on sand rock and is carried a minimum of 1 foot into the rock. The bridge is 1,189 feet 5 inches back to back of abutments, with flaring retaining walls extending from the east abutment to Main Street in Durand. From the west abutment, the first four piers are land piers with I-beam spans, while the remainder of the piers, with the exception of Pier No. 10, are in the river and support truss spans. The I-beam spans from the west abutment are respectively 62 feet 11½ inches, 60 feet 4 inches, 60 feet 4 inches, and 61 feet 1½ inches long. The next truss span is 151 feet 9 inches, then four each 152 feet long, and the last truss span 151 feet 9 inches. The span connecting Pier 10 with the east abutment is a 34-foot I-beam span.

Piers 5 through 9 are solid piers in the river, while Piers 1, 2, 3, 4, and 10 are open. This last pier at the east end is on land, with a river-side road running beneath the 34-foot I-beam span from Pier 10 to the abutment. Although the channel in the Chippewa River is very shallow, it is rated as a navigable stream and the old bridge had an unused swing span. In order to fulfill War Department requirements, the truss for span No. 9, between Piers 8 and 9, was designed as a future lift span. The footings for Piers 8 and 9 are larger, with a width at the top of the piers of 6 feet as compared to 5 feet for Piers 5, 6, and 7.

Piers 5, 6, and 7 were built with a second lift above the footing 9 feet high and 7 feet 1 inch wide with no taper.

The top section tapers to 5 feet wide at the top. On Pier 8 the second lift is only 4½ feet high and 8 feet wide. There is no second lift on Pier 9, which is tapered from the footing to the top. Piers 5, 6, and 7 measure 37 feet high from the base of the footing to the top of the pier; and Piers 8 and 9 measure 27 feet.

The footings of Piers 5, 6, and 7 are 9 feet wide and symmetrical about the center line of the pier, while the footings for Piers 8 and 9 are 13½ feet wide with the center line 3 inches off center. Piers 1, 2, 3, and 4 have two 8 x 12-foot footings 3 feet thick.

Piers 1, 2, and 3 have columns 4 feet square with right-angled noses up and downstream, making them 8 feet wide. They have no taper. A tie beam or cap



C. & E. M. Photo

A Speedcrane driving the falsework between Piers 7 and 8 of the new Chippewa River Bridge at Durand, Wisconsin.

at the top of the columns is stepped for super-elevation of the 5-degree curve which extends for the first 2½ spans from the west end, and has a thickness of 4 feet and a minimum height of 4 feet. The total width of the cap is 32 feet 1½ inches. Pier 4 has two columns measuring 5 feet square with right-

angled noses up and down stream extending the width to 10 feet. This pier carries the bridge seat for the first truss from the west end. The first four spans have seven I-beams with the outside stringers 33-inch I-beams and the interior stringers 30-inch I-beams. The

(Continued on page 50)

## Over 96% WATER RETENTION at 100° F

## Spray It On and the Curing Job is Done

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Curing concrete roads leading to Ford Bomber Plant with TRUSCON TRU-CURE.

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The Time and Money-Saving Method  
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This advanced technical development meets the emergency war requirements by speeding up the job and providing:

—stronger concrete (higher compressive strength); harder concrete (greater wear resistance); sounder concrete (freedom from checks and cracks); more serviceable concrete (minimum maintenance necessary); more water-tight concrete (greater resistance to freezing and thawing).

TRUSCON TRU-CURE provides this better con-

crete because through its high water retention, the natural processes of hydration have had opportunity for completion. Over 96% water retention at 100° F. in first 24 hours.

TRUSCON TRU-CURE is applied immediately after finishing. Equivalent to a 14-day water cure.

Clear liquid—will not discolor concrete. No clean-up afterward. No need for bulky curing material or the time and labor costs of handling it.

Approved by United States engineers.

**COMPLETE**  
WELL POINT SYSTEMS  
WILL DRY UP ANY  
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Faster—More Economically

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WRITE FOR LITERATURE to Dept. C-3 on this advanced method of curing concrete that saves time, labor, material—and does a better curing job.

# TRUSCON LABORATORIES

DETROIT • • • MICHIGAN



## Steep Ramps Used For 120-Foot Cut

**Pusher Used to Boost the Empty Scrapers Uphill; Small Scraper Proves Handy on Rim of Cut on Minn. Job**

† JUST 2 miles south of Fond du Lac, Minn., the country turns rough, the soil becomes clay, and when the weather is wet, grading operations stop. In this section, on Minnesota Highway 23, John Dieseth Co., of Fergus Falls, Minn., had 2 miles of grading on which his bid was \$172,687. New location, or heavy fills over the old road, made the job tough. He operated an elevating grader and truck outfit on long hauls for the fills and a scraper outfit for the really bad going.

### The Big Cut

The biggest cut on the job was 120 feet deep, from which the material was used to make a 500-foot fill, 60 feet high on one side and 20 feet on the other side, comprising a total of 134,000 cubic yards. Opposite the big cut, 40 feet had to be taken off another hill to bring it down to grade, and the material was moved north to another balance.

On this cut Dieseth used three Carryall scrapers, two bulldozers and a pusher, as well as an Ateco scraper and a Bros sheepfoot roller pulled by the same International tractor. Two other Carryall scrapers were used for other work around the cut, but did not operate in this big cut proper, because there was not sufficient room to maneuver more equipment.

As will be seen from the photograph, the grades were so steep on this cut that unless the clay was perfectly dry it was impossible for the tractors to pull the scrapers uphill even when empty, so a pusher was used in most cases. At times when the big scrapers became mired in the fill the pusher would hook on front with a heavy chain and all would come out in quick time.

When the scrapers came down over the big cut, even with the pans dropped, they sometimes came too fast for the tractor and skidded half sideways down the bank. The tractors then usually shifted into a higher gear to keep ahead of the scraper.

The work of the Ateco hydraulic scraper pulled by an RD7 was of unusual interest. In making the cut at the very top of this hill, the big LeTourneau scrapers could not safely tackle the very edge of the cut, and therefore a ridge



C. & E. M. Photo  
One of John Dieseth's large Carryalls at the top of the cut, ready to turn and bite its fill from the steep slope on its downward trip near Fond du Lac, Minn.

was left. This was handled by the Ateco operator in a novel manner. He would back the hydraulic scraper over the edge until his crawlers were at the edge and then would pull the Ateco scraper forward, cutting off the rim and delivering it at a sufficient distance from the edge so that it could be picked up

safely by the larger scrapers. To drive along the detour road and look ahead and see a scraper dangling over the edge of a steep cut was a bit disconcerting, but the tractor operator knew his stuff.

### Dieseth's Pusher

A couple of years ago John Dieseth

Co. developed a pusher plate for the rear of the LeTourneau Carryall scrapers which proved so successful that it has been adopted by a number of other outfits. The pusher plate measures 18 x 14 inches and is sufficiently solid to take the blow of the pusher tractor when it comes up behind. The shock on the scraper is greatly reduced by rubber inserts back of the plate on the scraper. The pusher plate on the tractor consists of two ½-inch plates with 3 x 4 angles between and is a solid affair with no rubber backing.

### Some Dirt Moving!

When the elevating grader outfit was operating on this job it ran one 12-hour shift, moving an average of 300 yards per hour which was hauled away by a fleet of 12 trucks with hauls varying from 2,000 to 3,000 feet. Five scrapers operating three shifts totaling 21 hours a day moved 5,000 yards from the heavy cuts onto the fills, spreading it in the specified 12-inch layers which were

(Concluded on page 26)

# "Gun" your LORAIN-

## 24 HOURS A DAY

Give it the "Gun" (grease) and add years to the life of your equipment

Typical pages from Lubrication section of Thew Handbook.

## \* But take care of it, too!

It's "all work and no rest" for most Lorain machines these days—tough, round-the-clock jobs that *must* be finished so the next one can be started. Sure, it's a strain on the equipment but Lorains are built with the care and skill that lets them spak up extra work.

So we say, "gun" your Lorain but take care of it, too. A little extra care and service will prolong its life still further and *help you do more with what you've got.*

## LORAIN headquarters are in the field

There is a Lorain distributor near you who can help make your equipment last longer and work faster. Many distributors carry a representative stock of genuine Thew-Lorain factory-made parts. They have facilities for rebuilding machinery and know how to rebuild it properly; they can furnish on-the-job field service for repairs and replacement; they can serve as a clearing house for information on rentable equipment or booms you may need for converting present machines. Call on them often.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

**THE STRONGEST GEARED POWER FOR ITS WEIGHT IN THE WORLD**

**ALL STEEL HAND HOIST**

SEATTLE, U.S.A.

**COMPACT—POWERFUL—SAFE**  
"For use where power is not practical or available" Manufactured in 2, 5 and 15-Ton Sizes. For capacity comparison, ½" cable used:

2-Ton "Lightweight"	75 ft.
5-Ton "General Utility"	250 ft.
15-Ton Triple-Geared "Special"	1200 ft.

Patent instant gear change and positive internal brake that never fails, and will lock load.

Gear Ratio	Weight	Seattle Price, f.o.b.
2-Ton 4, & 22 to 1	60 lb.	\$ 58
5-Ton 4, & 24 to 1	110 lb.	\$ 75
15-Ton 4, 19 & 109 to 1	680 lb.	\$250

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# THEW-LORAIN

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### Five Westinghouse Plants Receive Army-Navy Award

Five Pennsylvania and New Jersey plants of the Westinghouse Electric & Manufacturing Co. have been selected to receive the new Army-Navy Award for high achievement in the production of war equipment, according to an announcement received recently.

The new Army-Navy Production Award supersedes the Navy "E" and the Army "A" Awards which in the past have been conferred separately on war production plants. Symbolizing continued excellence in production, the red

and blue pennant is awarded only for six-months periods. To be retained by a plant, it must be re-won every six months.

### Analysis of Plan for Production Requirements

Another in the series of analyses of current business-government problems by the Research Institute of America, Inc., has recently been published, dealing with the Production Requirements Plan and how the new priority system works.

The subjects covered include such vi-

tal topics as the new priority system, basic priority controls, what to do about ratings, the PRP plan, distributors' ratings, allocation classification symbols, accounting and records, and the PRP ten commandments.

Although these studies by the Research Institute of America are usually available only to its members, because of the urgency of the times, copies are being made available generally in the belief that they will contribute to a better understanding and effective prosecution of the war program.

Copies of the "Production Requirements Plan" may be secured by those

interested direct from the Research Institute of America, Inc., 292 Madison Ave., New York City. Price: \$2.00.

### Hobart's Role in the War

A new 20-page color catalog recently issued by Hobart Brothers Co., Troy, Ohio, editorially and pictorially explains the products, manufacturing and engineering facilities, and wartime activities of the companies making up the Hobart group of factories.

Copies of this catalog, entitled "The Hobart Group," may be obtained direct from the manufacturer.

## BEFORE THE LAST BOMB FALLS . . .

American air bases have been bombed in this war and they will be bombed again. But they don't *stay* bombed. To the dauntless spirit of our Air Force ground crews and the machines at their command goes credit for the speed with which shattered runways are restored to service.

Almost before the last bomb strikes — while our fighter planes and anti-aircraft batteries are still taking vengeance in the sky — a helmeted soldier drives his "Caterpillar" Diesel Tractor on the field. He is master of a steel brute, rugged and powerful, built to conquer the toughest earth-moving jobs. In front of the great bulldozer-blade, tons of dirt and rock tumble back into bomb craters. And in a matter of hours — not weeks — the base is ready again.

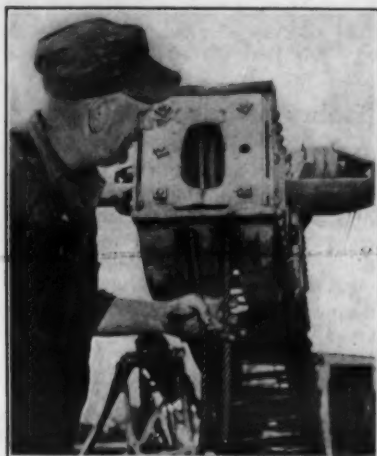
"Caterpillar" Diesel Tractors, Motor Graders, Engines and Electric Sets are helping in the fight on hundreds of fronts. Everywhere they're saving men and the time and labor of men. They're breaking trails for troops, rescuing tanks, building and repairing military roads and landing fields, hauling big guns, powering searchlights and field telephones, clearing beach-heads, supplying main or stand-by power for Navy and Coast Guard craft.

The machines we make are on war duty. "Caterpillar" men will keep right on building them night and day, and "Caterpillar" dealers will keep right on servicing them so that they will deliver full power, for this one all-important purpose, until the big job is done.

# CATERPILLAR DIESEL

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS  
TO WIN THE WAR: WORK—FIGHT—BUY U.S. WAR BONDS!





Sam Schmidt inspects his preformed cables which stand up better than ordinary rope on small sheaves.

## Preformed Wire Rope Aids in War Effort

(Continued from page 1)

as much difference in the operation of the machines which were preformed-equipped as there was between a mule-hand-scoop outfit and one of our big power shovels.

"Take it step by step from the day a new rope is brought to the machine until retirement, and check the record of daily performance. The most skeptical operator will be convinced that there is no comparison in operation, speed, safety, or results in work accomplished.

"With ordinary rope it takes me from 40 minutes to an hour and a half for breaking in. This allows the rope to run through the machine from 15 to 45 times, depending on the need. After this preliminary work, I watch operations and load takings for several days before it is safe to give my job the gun.

"A preformed rope is usually run through my machine once, never more than twice. This is to allow the rope to adjust itself and to see that everything is hooked up O.K. I save an hour of my company's time with preformed installation, and a full two-shift day

because there is no 'easing' period.

"With ordinary, before I cut a rope, it must be seized several times ahead of each open end. However, I've found that cutting with a blow torch saves considerable time because it tends to hold the brush ends together. With preformed there is no mushrooming at the cut or broken ends. I've never had to use seizing on a preformed rope.

"When a rope has to be changed, or breaks often, the fact that you do not have to discard a length at each open end is a considerable saving. This, plus the time saved, means a substantial cost saving between the two types of rope when used in crane work."

### Preformed Stays Put

In operation, the preformed stays in place better on the drum, especially where drums are small or worn. There is a certain trained element in the preformed which is hard to explain, Schmidt says, unless you have operated both ordinary and preformed-equipped machines, doing the same type of work.

The real difference to the operator is in the feel rather than any result which can be put into words. Preformed rolls easier. Its spooling on a small drum can not be compared with ordinary; and its complete flexibility enables it to almost handle itself. All of this saves operator time and enables the machines on the job to turn out more hours of work.

"I've used preformed on P & H, Koehring, and several other new large-type cranes," Schmidt continues, "and I've found results from preformed the same with every machine. On cranes such as I operate, preformed lasts from one-third to one-half longer than ordinary, doing the same type of work, under the same conditions.

### It Can Take It

"The rope receiving the greatest punishment is a drag line. The average life for an ordinary wire rope drag line, operated in two shifts daily, on our type of work, is from three to five days. Now we have changed to preformed for all

drag lines and it has proved a real saving as our drag lines now last us an average of two weeks.

"Besides the longer life, we've never had an accident which resulted from using preformed rope drag lines. The men like to work with it better because, as they say, 'it's made to handle.' And when men learn that a rope is working with them instead of against them, work results are near doubled.

"Recently most of my work has been on Government contracts, at airports, camp sites, etc. I think it is safe to say that our machines are delivering 25 per cent more work per hour of operation because of our 100 per cent preformed equipment.

"I don't believe there is an operator in the country today, who has given preformed a test, who would willingly go back to ordinary. I know I wouldn't."

*Buy War Bonds and Stamps. There is no safer or more profitable investment in the world than a share in Victory and Freedom.*



### FRONT LINE MIGHT

rests on rear line constructive power. **CONSTRUCTION MACHINERY** stays longer hours in productive service when lubricated with . . .

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These quality lubricants are designed to step up operating performance and step down operating costs.

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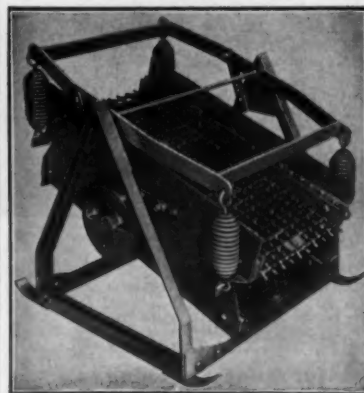
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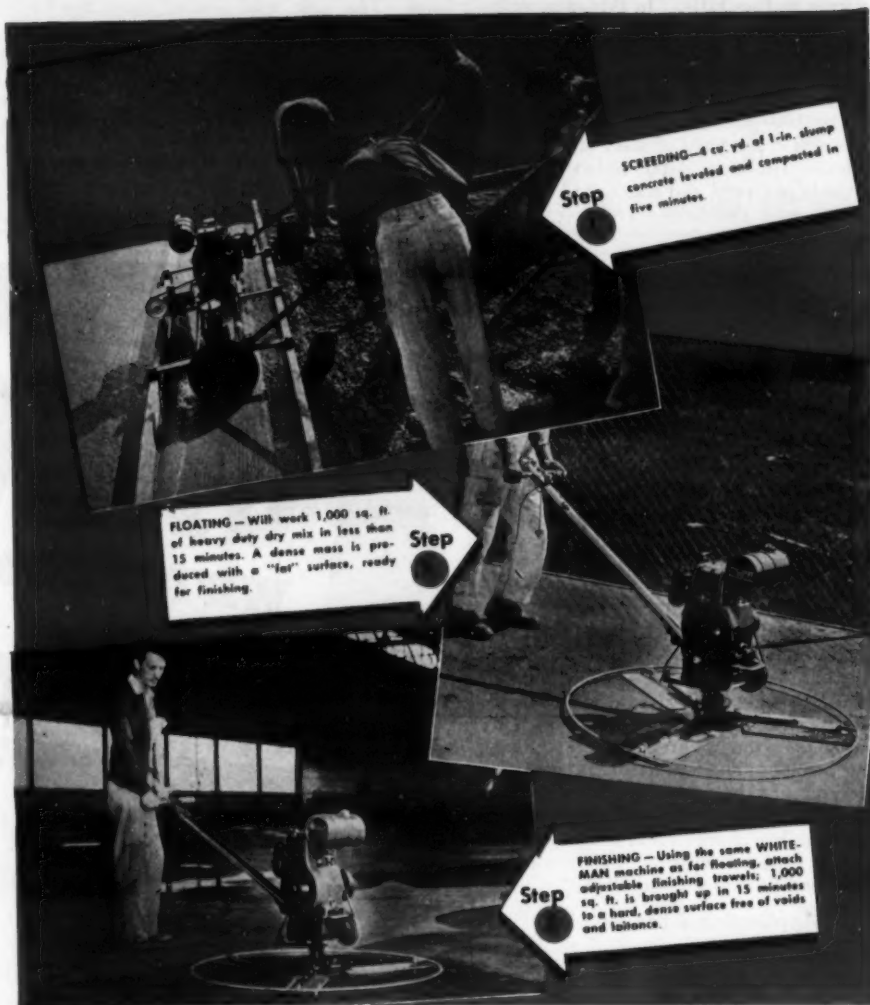
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PASSAIC, NEW JERSEY

# The Whiteman "3-Step" Precision Method Adds 40% to your Present Crew's Concrete Finishing Capacity!

With the WHITEMAN Mechanized "3-Step" Precision Method your present crews can screed, float and finish concrete slabs in two-thirds the usual time. That's the record of many contractors who have increased the capacity of their crews 40% or more; have relieved critical labor shortages and have speeded vital war construction projects at lower cost!

Job-proved WHITEMAN Machines get uniformly high quality concrete, indoors or out. Use the WHITEMAN "3-Step" Precision Method on your next concrete slab job! Equipment needed isn't expensive, pays for itself on the job—and we can make prompt delivery!

The "3-Step" way finishes concrete faster—assures smoother longer life surfaces. For the name of your nearest dealer write us TODAY.



## Step 1

**SCREEDING**—The WHITEMAN power operated Rodding Machine simultaneously levels and compacts the concrete while operated by one man. Experienced contractor-users report 4 cu. yd. of low-slump concrete can be handled in 5 minutes.

The two rod sticks (screeds) of the WHITEMAN machine ride the headers. Driven by the gasoline engine, the rod sticks make 5-inch transverse strokes—in opposite directions. During the power driven transverse movement, a steady pull forward by the operator provides a uniform rate of advance. This leaves a pour that has been compacted and leveled—ready, when sufficiently set, for Step 2.

## Step 2

**FLOATING**—When you are ready to float the slab, attach the "Heavi-Duti" FLOAT TROWELS (10' x 18", 12-gage steel) to your WHITEMAN Finishing Machine. As your machine moves over the pour it produces a perfect float finish at high speed with the strong, broad trowels, which rotate while lying flat on the concrete surface. WHITEMAN finishers, float-trowel equipped, will cover 1,000 sq. ft. in as little as 15 minutes. When the "floated" slab has set sufficiently it is ready for Step 3.

## Step 3

**FINISHING**—Put the easily attached "FINISH" trowels on your WHITEMAN machine. These lighter, flexible and adjustable blades (6' x 18", 17-gage steel) bring up the surface in a hurry, leaving a finish far superior to hand work. WHITEMAN Finish Trowels give you a harder, denser surface, free of voids or laitance that costs less to finish, and wears longer.

Remember, too, only *One Machine*—the WHITEMAN Precision Finishing Machine (48" in diameter)—with two interchangeable sets of trowels, will do *both floating and finishing jobs*. You don't have to double your machine investment; you do double the work capacity!

**Whiteman MANUFACTURING CO.**  
3240 CASITAS AVENUE      Dept. C      LOS ANGELES, CALIFORNIA



# Salt Replaces Sand In Road Ice Control

## New Hampshire Shifts from Extensive Sanding of All State Highways to Melting Snow Before It Forms Ice

† PRIOR to the winter of 1941-42, it was the policy of the New Hampshire State Highway Department to sand its roads from end to end, and not just at curves and on hills. In this manner no treacherous areas could develop through sudden local ice storms. Sand was stockpiled under sheds to protect it as much as possible from storms, and from 50 to 100 pounds of calcium chloride was added per yard of sand in the stockpiles. This was later reduced to 20 pounds per yard and was found equally effective in preventing freezing of the sand in the pile.

During the past winter the method was changed completely, using sodium chloride alone, effecting a saving of about \$200,000 or about one-third the sanding costs, and eliminating the use of sand almost altogether. Another contingent saving in the new method is that the sand does not have to be swept up into piles along the edge of the road in the spring and hand-loaded into trucks.

### Melting Studies

Over a period of years careful records of temperatures at which ice storms occurred and of temperatures immediately following snow storms showed that between 20 and 30 degrees F. existed at the time rains froze immediately upon striking the ground and this same temperature existed after practically all snowstorms. At this temperature sodium chloride of the CC grade will start melting the loose snow and will prevent the freezing of rain as it strikes the chloride. Based on these studies and observations, the complete change from sanding to the use of sodium chloride was begun in 1941 and proved very successful.

### Application After Plowing

Instructions were issued to patrolmen to apply the CC grade sodium chloride in a strip 2 feet wide along the center of the roadway immediately after the initial plowing. The effect of this was

to start melting of the small amount of snow which could not be removed by plowing and the draining of this solution to the two sides of the road, effecting further melting.

The device used to apply the chloride consisted of a fan-shaped distributor about 6 inches above the road surface to which the chloride was delivered through a hopper and a 1½-inch connecting pipe. The salt was poured into the hopper from the shipping containers and its rate of flow regulated by a gate in the pipe outlet. This whole device was so constructed that it could be hooked on the tail-gate of a truck or on the side of the body. The latter position had its advantages in that the truck could keep to the right side of the roadway and apply the chloride down the



C. & E. M. Photo

The old method of ice control in New Hampshire, requiring many sheds like this for the protection of sand, has been replaced by the use of salt.

center of the highway, while attaching the device to the rear of the truck made it necessary to operate the truck in the middle of the highway. The rate of application was ¼ pound per square yard of roadway to be treated, applied as a strip 2 feet wide in the center of the road.

### Results Variable

In spite of the explicit instructions furnished to patrolmen regarding the time and method of application of the sodium chloride, there were some variations with both good and poor results. Where poor results were obtained it was

(Concluded on page 31)

**GANGWAY!**  
WE'RE COMING THROUGH  
FOR *Uncle Sam*

*Bucyrus-Erie*  
Hydraulic  
**BULLGRADERS**  
and  
**BULLDOZERS**

No tractor power is wasted when Bucyrus-Erie blades dig in . . . that's why they're getting tough, war dirt-moving jobs done ahead of schedule. These units enable the tractor to apply full tractive

effort to the blade; relieve overloads on front idlers and other parts of the tractor affected by nose-heaviness . . . because they maintain the tractor's center of balance so that crawlers are always kept full length on the ground. The safe, low pressure hydraulic control system gives the operator positive up-and-down control of the blade for smooth, accurate grading. There is plenty of down pressure behind the blade, too — enough to jack the front end of the tractor off the ground. This means plenty of penetrating power when working in tough materials. BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin.

**BUCYRUS-ERIE**  
TRACTOR EQUIPMENT

SEE YOUR  
**INTERNATIONAL TRACTOR**  
DISTRIBUTOR

**RED DEVIL**  
LIGHT  
and POWER PLANTS  
800 to 50,000 WATTS



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Long Island City, N. Y.





Members of the LeTourneau power control unit assembly line express their pleasure at the production of the 25,000th unit. This one is now in service for the Army Engineers.

## 25,000th Power Unit Off Assembly Line

The 25,000th LeTourneau power control unit came off the assembly line at the R. G. LeTourneau plant in Peoria, Ill., in July. This heavy-duty model R8C was painted Army green and is now in active service on a Caterpillar D8 tractor with LeTourneau bulldozer for the Army Engineers. These power control units transmit power through cables for the operation of earth-moving and construction equipment teamed up with tractors.

R. G. LeTourneau, Inc., reports that just 18 months ago the 15,000th power control unit was completed and shipped to a West Coast LeTourneau-Caterpillar distributor.

## Procedure for Testing Soil-Cement Mixtures

The primary requisite in producing a soil-cement pavement with satisfactory structural characteristics, serviceability and durability is that an adequate quantity of cement be incorporated with the soil. Secondary requisites are (1) that the proper amount of water be mixed uniformly with the soil-cement mixture; and (2) that the moistened soil-cement mixture be compacted to a uniform maximum density before cement hydration. Each of these fundamental factors can be accurately determined for any soil by laboratory tests.

A booklet recently issued by the Portland Cement Association, 33 W. Grand Ave., Chicago, Ill., entitled "Soil-Cement Mixtures—Laboratory Handbook," is devoted to the methods of making these soil-cement tests. Procedures of test are given in detail and the desirable accuracy to maintain when making the tests is indicated. A considerable portion of the booklet is devoted to soil surveying and soil sampling and a brief review of research on soil-cement is also included.

This new booklet and the related publication, "Soil-Cement Roads—Construction Handbook," may be obtained without charge direct from the Portland Cement Association by mentioning this item.

## WON'T QUIT or cause time out



A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

The Hayward Company  
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**Hayward Buckets**

## Curing Compound Meets Federal Spex

Klearcure No. 60, a transparent concrete curing compound with or without fugitive coloring, meets Federal, state and municipal specifications for curing concrete runways, pavements, bridges, floors and similar structures, according to the producer, the Construction Materials Dept., National Automotive Fibres, Inc.

This curing compound, which is the result of nine years of research, is easily sprayed on fresh concrete, producing concrete of high compressive strength, and reducing the possibility of shrinkage, hair-checking, dusting and scaling. The producer states that one application provides a modern and simple method for curing any concrete mass. One coat dries firmly in a few minutes and not only retains the mixing water but also prevents damage from rain which might fall before the concrete has hardened, it is reported. Klearcure can be applied by hand or

power spray or by brushing.

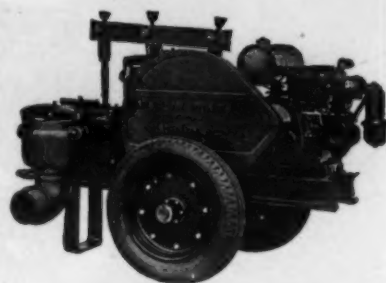
If desired, Klearcure is available with ingredients of color deep enough to be easily visible when applied, thus insuring even application. The color disappears in a few days.

Literature giving further details on Klearcure No. 60 may be secured by interested engineers and contractors direct from the producer at 101 Park Ave., New York City, or from this magazine.

## Highway Research Board Will Meet in St. Louis

The Twenty-Second Annual Meeting of the Highway Research Board will be held December 2 to 4, 1942, at the Hotel Statler in St. Louis, Mo. According to Roy W. Crum, Director of the Board, it is expected that time and travel facilities will be greatly conserved by holding this meeting contiguous to that of the American Association of State Highway Officials which will be held in St. Louis the following week.

## 4" Single Mud Hog Pump on Pneumatic Wheels



The "Old Reliable" Mud Hog brought up to date.

Gearing enclosed—running in oil.

All cut gearing.

Die-forged crankshaft in pump.

Available in the ball valve Force type, or the flat valve Open Discharge.

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**MARLOW PUMPS** RIDGEWOOD, NEW JERSEY

**"Here's how you can spot the 'criminals' that steal wire rope life..."**



**Look for them regularly... to save your time and money... and America's steel**

"If YOU WANT to get every hour of safe service that's built into your ropes, tell your maintenance men to get up on the cranes and shovels regularly... up where the wire rope operates. Tell them how to inspect it... how to look for the clues to what is damaging your wire rope and how to establish your own standards for deciding when it's necessary and economical to replace your wire ropes.

As a first step, tell them a rope should be judged by the condition of the most severely damaged lay... one rope lay being that length of rope in which one strand makes one complete revolution around the rope...



And to select the worst lay, make a counting of the broken wires. Watch to see if the breaks are concentrated in one or two strands. If this is the case, the rope will be considerably weaker than if they are evenly distributed.

You'll probably find some breaks caused by *Abrasion*. In extreme cases they look like this...



and even when not worn through, any removal of metal due to wear weakens the rope in direct proportion. Abrasion breaks occur most frequently where rope goes over sheaves and drums.

There may be breaks caused by *Fatigue* which look like this...



and occur where the rope has been bent around too small a radius too often or has been subject to vibration or whipping. Fatigue breaks also occur after the wire has been damaged by *Corrosion* which shows up as pitting on the surface of the wire. Improper lubrication is to blame and contributes to tension and abrasion as well.

There may be breaks caused by *Mechanical Abuse*. This cut or gouged wire is one example...



Careless handling during installation or an accident on the job may cause cut wires like this or mashed wires with flattened or spread ends. Mechanical abuse sometimes may so weaken the wire that it will fail in tension.

Finally, if there are breaks caused by *Tension* they will look like this...



And will show one side of the broken wire cupped and the other coned. Tension breaks are always caused by an overload on the wires, which may or may not have been weakened by abrasive wear, by corrosion, or by mechanical abuse. When tension breaks are found, it is usually obvious that the rope is unfit for further duty and in any event should be discarded.

As a last step, have a record kept of the condition and the service life of each wire rope, cut out the worst section when the rope is taken off and send it on to the manufacturer for an ultimate strength test. This will complete your inspection record and form a basis for future inspection and condemnation decisions.

Then, you'll be on the way to getting the maximum useful rope life built into every inch of Roebling "Blue Center" Steel Wire Rope—without taking chances on untimely and dangerous breakdown of equipment vital to wartime production schedules."



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TRENTON, NEW JERSEY  
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**ROEBLING**  
*"Blue Center"*  
**STEEL WIRE ROPE**  
PREFORMED OR NON-PREFORMED





Making the live-load test on an Armco Emergency Wood Pipe. The 28,160-pound load on the main axle is 50 per cent greater than the maximum permitted by most state highway departments.

### Strength Tests on Wood Pipe Reported

An interesting report on the strength tests on Armco Emergency Wood Pipe has recently been issued by Armco Drainage Products Association and contains information of value to Federal, state, county and town engineers and others concerned with the design and construction of culverts and drainage structures.

The purpose of the investigation was to determine the structural behavior of a new type of wood pipe and the pipe-arch developed by Armco as a substitute for metal pipe during the period of steel conservation. The new pipe, known as Armco Emergency Wood Pipe, consists of a series of inter-connected polygonal-shaped rings, each side of which is a prefabricated segment, the ends of which are mortised and doweled together so as to form a semi-flexible hinged corner.

Three types of tests were made: laboratory, live load, and dead load. For the laboratory tests, twenty specimens ranging from 24 to 72 inches in diameter were tested in two-point bearing. These tests, it is reported, showed that the wood pipe has a degree of flexibility comparable to standard corrugated metal pipe. A second conclusion was that failure occurs at the corner joints after the pipe has deflected sufficiently to put the mortised ends of the members in severe bending.

The live load consisted of a truck weighted to give an axle load increasing from 11,420 to 28,160 pounds, or 50 per cent more than the legal limits of most states. The fill over the wooden structures varied from 0.9 foot to 4.2 feet, and maximum deflection was less than  $\frac{1}{2}$  inch under the heaviest load.

The dead-load test was made by piling steel ingots on a 48-inch octagonal-shaped pipe under 4 feet of cover and was carried to failure which occurred at 130 tons, or the equivalent of 40 feet of earth cover. The report indicates that this test showed that the polygonal wood pipe carries dead load similarly to corrugated metal pipe; that the dowels in the joints serve to give the pipe a certain degree of inherent strength but beyond that they have no bearing on the ultimate strength of the pipe; and that regardless of the dowels, the corners remain engaged and

transfer stress to the adjacent segments until the mortised projections fail or the angle in the corners approaches 180 degrees.

A limited number of copies of the 43-page illustrated report containing a description of these tests and their results and conclusions are available and may be secured by those interested direct from Armco Drainage Products Assn., Middletown, Ohio, by referring to this item, or from this magazine.

### Use of Calcium Chloride To Prevent Frost Heaves

The prevention of detrimental frost heaving and spring break-up on military roads and airport runways as well as on the traffic arteries of the country is of vital importance to provide uninterrupted transport service and to simplify the maintenance problem.

A new information sheet "Preventing Detrimental Frost Heaving" which suggests a practical approach to this problem has recently been prepared and released by the Calcium Chloride Association. This sheet reports that research findings show that very small proportions of calcium chloride in soils will

prevent detrimental frost action, and that field reports on soil-aggregate bases treated with calcium chloride provide confirmation of the value of such treatment.

Copies of this information sheet, Brief F-61, may be secured by those responsible for the construction and maintenance of airport runways and state, county and town highways direct from the Calcium Chloride Assn., Penobscot Bldg., Detroit, Mich., by referring to this item.

### Kinney Dallas Office Closed

The Kinney Mfg. Co., Boston, Mass., has announced the closing of its District Office at Dallas, Texas, due to the fact that H. A. Perry, Jr., District Manager, has resigned to enter the U. S. Ordnance Department.

All correspondence from the district, formerly handled by the Dallas Office, will be taken care of by the nearest office or the company headquarters in Boston.



## Release 3 Kettle Crews for Other Jobs!



Hand Spray Work With a Truck Mounted Model SJ.



Seal Work With a Four Wheel Trailer Mounted Model SJ.



Secondary Construction Work With a Truck Mounted Model SJ.

#### Manpower is running short.

Even if the substantial money saving were not important, an SJ Maintenance Distributor is almost a "must" today to replace the work of men called to the armed forces, gone to war jobs, or needed for other tasks.

One operator with a Model SJ Distributor and one truck driver can replace three kettle crews on shoulder spraying, patch work, crack filling, and all types of maintenance.

1. Equipped with spray bar, hand spray, motor driven pump, and gravity draw-off cock, an SJ can be instantly switched from maintenance to sealing, or secondary road construction.
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  - (b) Load the material tank from an outside source.
  - (c) Circulate the material within the tank to speed up heating.
  - (d) Pump from one outside source to another outside source without going through the material tank.
  - (e) The special bituminous pump will handle any type of material from emulsion to the heaviest asphalt.
4. The SJ comes in pump sizes which range from 35 GPM to 100 GPM—spray bar lengths of 4' to 12'. Can be mounted on a 2-wheel trailer—a 4-wheel trailer—or on the back of a truck.

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# Concrete Flood Wall In Tight Quarters

**Chas. D. Smith, Contractor  
For High Concrete Wall at  
Portsmouth, Ohio, Began  
Work in Narrow Alley**

† THERE are two ways of breaking in a new construction crew: pick the easy part of the job and get them organized so they can go through the tough spots without trouble; or give them the toughest spot to cut their teeth on and let them sprint on the less difficult sections. Charles D. Smith of Fond du Lac, Wis., to whom the contract for the new flood wall in Portsmouth, Ohio, along the Ohio River was awarded for \$448,170.36, chose the College of Hard Knocks to educate his green crew.

## The Cantilever Wall

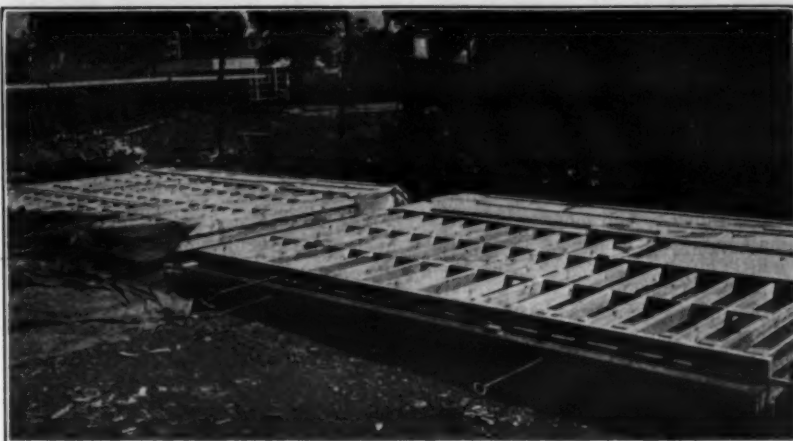
The flood wall is typical of the design used in the Cincinnati District, U. S. Engineer Department. A typical section on the contract under discussion is 29 feet high for the wall which is 18 inches thick at the top, vertical on the river-side face and battered 1 on 12 on the land side. The key or cut-off at the outer edge of the footing on the river side on this typical wall is 7 feet deep from the bottom of the footing and 3 feet 2 inches wide at the top and 2 feet wide at the bottom. The footing is 3 feet thick at the junction with the "stem" or wall and 2 feet 3 inches thick at the outer edge on the river side above the key or cut-off. A 1 on 22 slope is given to the top surface on the water side while the bottom remains level. The land-side section of the footing is slightly more than 3 feet thick at the base of the wall and 1 foot 6 inches thick at the outer edge which is 10 feet  $\frac{7}{8}$  inch from the inner face of the wall, while the river-side leg is 16 feet 4 inches for the maximum section, where the base of the wall is 3 feet  $\frac{7}{8}$  inches thick. A haunch or sloping section is made in the footing where the wall rests on it to relieve the stress which is concentrated at this point. At the land-side edge of the footing is a toe drain 12 feet deep with a 6-inch perforated concrete pipe encased with sand and gravel.

On this particular contract there was a considerable variation in foundation conditions and much of the length of the wall required special treatment before pouring the footing. At an old steel mill there was a waste pile which had to be excavated a maximum of 20 feet, backfilled with impervious silt compacted by a sheepsfoot roller, brought 6 inches above the elevation of the bottom of the footing, and then excavated back to grade to insure a solid foundation.

In 1908 the City of Portsmouth installed approximately 2,000 feet of concrete flood wall, the top of which is 15 feet lower than the top of the new wall. Part of the old wall was removed under the present contract and as the old footing was below the elevation planned for the footing of the new wall, it was more economical to remove the old footing and compact backfill in the excavation

to secure an adequate impervious foundation for the new wall.

In the "Tight Quarters" described in more detail later on in this article, the contractor had to build the wall down an alley which had been abandoned and built over many years ago, but which contained undisclosed cisterns and privies. A total of nineteen of these were located in a 300-foot block and one was over 40 feet deep. Inasmuch as the contractor was allowed unit excavation prices for only 1 foot outside of masonry structures which had to be removed, he used a  $\frac{3}{4}$ -yard clamshell bucket to excavate these cisterns and privies and then when the backfill was placed in 4 to 6-inch layers it was compacted by a 30-inch x 42-inch block of reinforced concrete operating as a tamper from the



C. & E. M. Photo

Form panels for the Portsmouth, Ohio, flood wall were built face down in a small yard adjacent to the work.

boom of the crane.

## Forms and Bracing

The wall was poured in 40-foot sections: first the key or cut-off wall in a

trench, then the entire footing as a 40-foot monolith, and finally the "stem" or vertical wall as a 40-foot monolith in alternate sections. The contractor se-

(Continued on page 32)



● We hope you have never had a lost-time accident due to wire rope. Some operators have—and *this* is no time to have workmen laid up with a blood-poisoned hand. Some operators have drastically reduced compensation claims by adopting American Cable **TRU-LAY PREFORMED**—the safer rope. . . . Being preformed, American Cable **TRU-LAY** is tractable—flexible—easy to handle. It resists kinking and snarling. Worn or broken crown wires lie flat and in place—refusing to wicker out to puncture hands or tear clothing. . . . Furthermore, being preformed **TRU-LAY** will last longer than ordinary cable. It has far greater resistance to bending fatigue. That means reduced machine shutdowns for replacement—steadier production—greater dollar value. . . . All American Cable ropes identified by the Emerald strand are made of Improved Plow Steel.

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## Building Approach To Lincoln Tunnel

(Continued from page 2)

of woven cotton asphalt-impregnated fabric, applied to and mopped with hot asphalt, and one course of brick laid in mastic on the fabric. For the sides, two layers of membrane and 8 inches of brick in mastic were placed as waterproofing. The concrete for the structure was placed directly on the waterproofing.

The concrete for the entire job was furnished by the McCormack Transit-Mix Concrete Co., of New York City and delivered to a hopper and thence to an elephant trunk to the invert or wall sections. The concrete crew for the invert generally consisted of top and bottom chute men, three shovelers and a foreman. The invert, which forms the bottom of the fresh-air duct, is a parabola with a span of about 16 feet and a vertical height of 6 feet. To insure a uniform flow of air without eddy currents, great care was taken in the alignment and finishing of the invert. The contractor developed a novel set of templates which were carefully lined up. The templates consisted of angles spanning the invert and supporting a T bar heated and bent to the exact contour of the invert. To stiffen this further, an A-frame was welded to the curved section and the horizontal section. These frames were set up at 10-foot intervals and used with 12-foot straight-edges to strike off the invert accurately. The concrete was vibrated before hand screeding and then given a smooth finish by hand floating.

The roadway is 21 feet 6 inches wide and consists of a 14 to 15-inch reinforced-concrete slab of 4,000-pound concrete. The road slab is reinforced with 10-inch I beams spaced 20 inches on centers, with  $\frac{3}{4}$ -inch round rods running longitudinally below and  $\frac{1}{2}$ -inch square deformed rods above the beams, and  $\frac{1}{2}$ -inch square rods placed transversely top and bottom in the slab midway between the beams. The roadway was poured in 50-foot sections and adjacent sections were poured every 48 hours. On this job all concrete was poured contiguous except the protection concrete for the invert which was poured in alternate 10-foot sections.

Immediately above the invert are the

haunches or fresh-air duct side walls which are poured at the rate of 30 feet per day. A novelty in the handling of this work was setting  $\frac{1}{2}$ -inch bolts in the roadway 8 inches from the edge and spaced 5 feet apart for bracing the form work for the lower section of the walls.

### The Steel-Bent Section

The connecting section between the open plaza and the completed portion of the tunnel consists of 134 steel bents generally spaced 5 feet center to center. Most of the columns are 12-inch Carnegie H-beam sections varying from 120 pounds to 64 pounds per foot. Instead of setting the base plates, which were welded directly to the columns, on a concrete pad to grade, the contractor insured the proper setting by placing the bearing plates on two 1-inch angles each about 15 inches long, previously set to grade. After the columns were erected and the ceiling and roof beams riveted, the space between the angles and the bearing plate was hand-grouted.

At the easterly 59 bents, because of

the low headroom between the street and the roof of the steel-bent section, the exhaust air duct is located on the south side of the tunnel instead of overhead. Exhaust air ducts in this area are located between the roof beams above the ceiling and are connected to the main duct on the south side of the tunnel. In the westerly portion, the exhaust air duct is above the roadway. Between Bents 7, the most westerly bent, and Bent 75, the ceiling beams are Carnegie CB subway column sections weighing 50 and 60 pounds per foot. The roof beams in these limits are 36-inch 230 to 160-pound Carnegie beams. From Bent 75 east, no ceiling beams are used and the roof beams vary from a 33-inch CB 141-pound beam to 36-inch CB 230-pound beams, with occasional built-up 24 and 21-inch CB beams with cover plates.

### Safety and Accuracy

At badly jointed rock and faults in the 670 feet of steel-bent section, the contractor drilled holes in the rock, using a 2-inch bit, and then drove in with

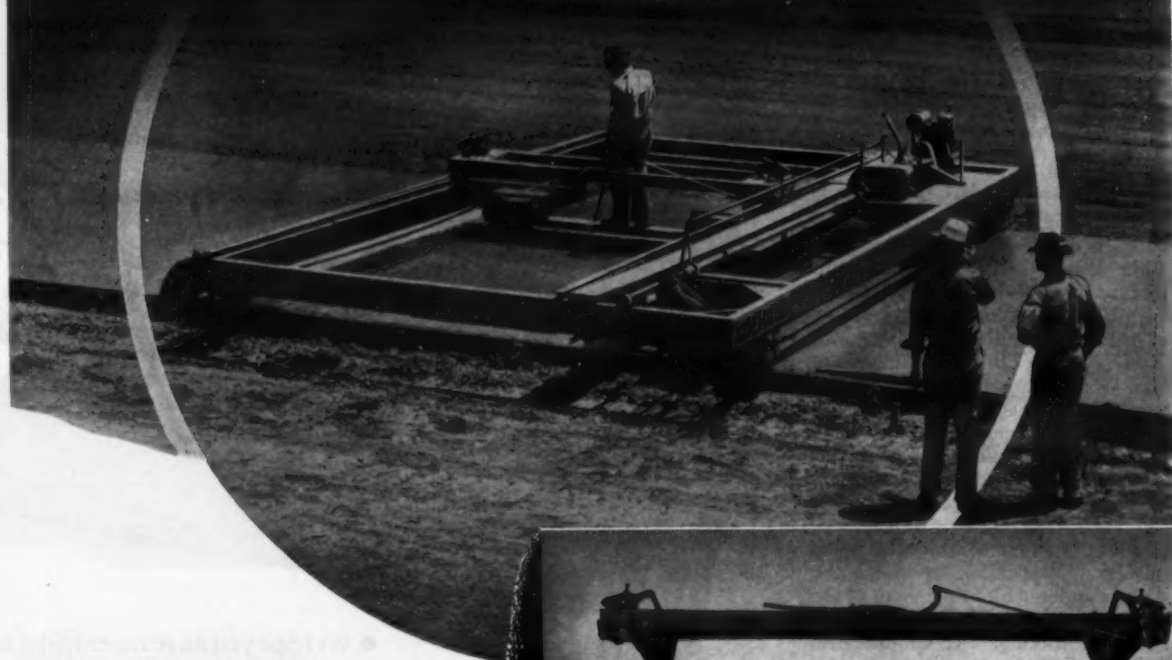
hand sledges 2-inch steel dowels which were then bent up against the overlying rock with the sledge to prevent rock from falling into the sections during construction.

A novel method of handling the form work for the wall section was used by the contractor. Rails with 8-foot gage were set on the invert and a wood jumbo with  $\frac{5}{8}$ -inch plywood side forms was run along the rail to pour 30-foot sections of the walls of the fresh-air duct.

All of the temporary steel girders for supporting Eleventh Avenue over the cut and also for the roadway support in front of a large meat-packing establishment located between Eleventh and Twelfth Avenues were from old elevated railway structures which have been removed in New York and Brooklyn in the past few years. The temporary columns for these girders were also from the same source. There is some satisfaction in the fact that not all of these elevated structures were shipped to Japan.

(Concluded on next page)

# ACCURATE SLAB FINISH CORRECTS SURFACE ERRORS.



## MECHANICAL FINISHING IS ACCURATE...

The Koehring Longitudinal Finisher finishes the slab surface in exact accordance with the crown specifications. Surface errors... excess or shortage of concrete affecting thickness of slab... are immediately detected because the Finisher screed accurately follows the crown of the slab. High spots are sheared and low spots filled. Correction of surface can be made with saving of concrete. Mechanical finishing with the Longitudinal Finisher is possible after initial set has occurred. Correct timing assures a smooth, accurate finish.

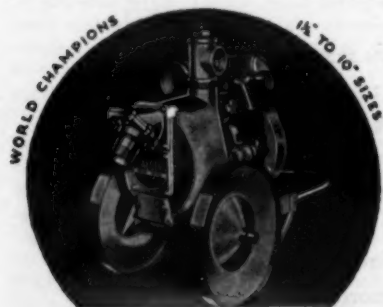
KOEHRING COMPANY, Milwaukee, Wis.



Carriage and screed travel along specified crown as controlled by carriage wheels on the template tracks. True contour of the slab is assured by this mechanical method. Slab thickness errors are quickly detected.



## HEAVY-DUTY CONSTRUCTION EQUIPMENT



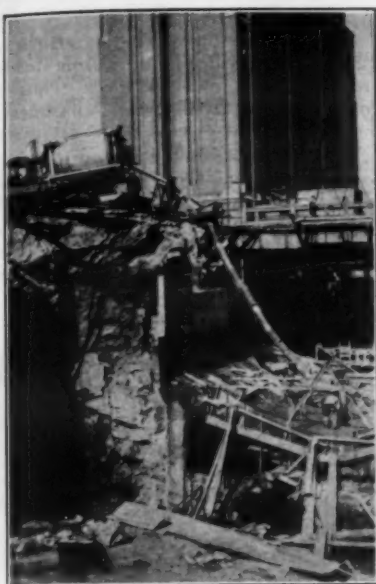
## Only JAEGER Pumps Have All These Features

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C. & E. M. Photo  
Concreting the fresh air duct invert at the east end of the steel-bent section of the Lincoln Tunnel.

## Second Tunnel Tube Nearing Completion

(Continued from preceding page)

A considerable amount of fire hose was used around the job and the contractor found that the only way to keep this new fire hose for his water connections was to paint the brass couplings green to make them look old. It was remarkable how little of the "camouflaged" new hose disappeared from the job, while obviously new hose practically evaporated.

### Major Equipment

For handling rock and lumber the contractor rented a Lorain crane mounted on an 8-wheel Mack truck and a Lorain crawler crane from Elmhurst Contracting Co. One of the contractor's own Northwest crawler cranes was also used for handling steel for the bents.

The air compressor outfit was located on a lot adjacent to Eleventh Avenue and consisted of one 700-cubic foot Chicago-Pneumatic compressor with a C-P diesel engine and a 500-cubic foot Chicago-Pneumatic compressor with a Caterpillar diesel engine. Adjacent to these two portables was a shed housing an I-R oil-heating furnace, an I-R drill sharpener and a large steel tank for quenching the Crucible drill steel. The foreman of the drill shop reported that up to 400 bits were sharpened and tempered per 8-hour day. The contractor

maintained several Kadco dust collectors on the job to protect jackhammer operators from the fine drill dust.

### Personnel

The new Manhattan approach to the Lincoln Tunnel is being built by the Port of New York Authority under the direction of J. C. Evans, Chief Engineer, with Charles L. Crandall, Superintendent of Construction, and George J. Brenner as Resident Engineer. Ralph Smillie is Engineer of Design. Both contracts for the work were awarded to George J. Atwell Foundation Corp. of New York City, for whom Robert Brennan is General Superintendent and J. M. Kyle is Project Engineer on this work.

## Second Volume Issued On Highway Practice

Volume II of "American Highway Practice" by Laurence Hsley Hewes, M. Am. Soc. C. E., and Chief, Western Region, Public Roads Administration,

has just been published. This volume deals with the various types of bituminous paving, the design and construction of concrete highways, brick roads, and miscellaneous highway structures such as small bridges, various types of culverts, grade-separation structures and protection devices, and special structures.

Together these two volumes cover the entire field of American highway practice, as the first volume discusses the subjects of highway location and design, grading, base construction, roadside development and low-cost and intermediate types of surfacing.

Each chapter in each volume is concluded with a summary of the subject under discussion and a well selected bibliography including references to magazines, books and papers in association proceedings.

Copies of Volume II of "American Highway Practice" may be secured by interested contractors and engineers direct from John Wiley & Sons, 440 Fourth Ave., New York City, or from

this magazine. Price: \$6.00. The two volumes are available at a price of \$11.00.

### Cement Co. Officials Die

The Universal Atlas Cement Co., New York City, sustained the loss of two members of its staff through sudden death last month. On August 15, Leonard Wesson, Operating Manager, died of a cerebral hemorrhage, and on August 17, Frederick Lee Stone, Vice President, died suddenly.

Mr. Stone began his career in the cement business as a salesman with Universal Atlas in 1911. In 1928 he became General Sales Manager, was elected a Vice President in 1932, and a Director in 1938.

Mr. Wesson was associated with both the Universal Portland Cement Co. and the Atlas Portland Cement Co. and when the two companies joined in 1930, he became Assistant Operating Manager, advancing to the position of Operating Manager in 1937.



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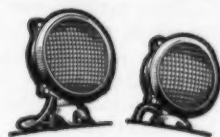
MACHINES take an extra dose of bruising in times like these. There's vital work to do—and it must be done now! If you operate an International Tractor, your hauling, pushing, and pulling is being handled by one of the toughest things that crawls. It's good to know your tractor can take punishment without being babied every step of the way. And here is something else that's good to know! You can make your Tractor extra tough and do extra hours of work every day with the help of International Victory attachments.

What are Victory attachments? Take a look at the drawings on this page. These attachments are added to Tractors built for the Victory Pool, released to eligible users by the WPB. You can bring your Tractor up to Victory specifications by ordering the attachments you need. See the nearest International Industrial Power dealer.

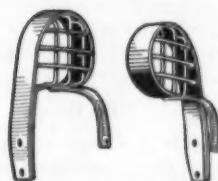
INTERNATIONAL HARVESTER COMPANY  
180 North Michigan Avenue Chicago, Illinois



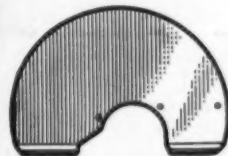
Exhaust muffler attachment.



Head lamps. Permits night work.



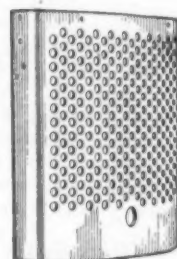
Head lamp guards. Protects lamps from breakage.



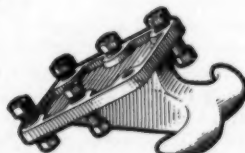
Front idler shield attachment. Prevents damage from stones.



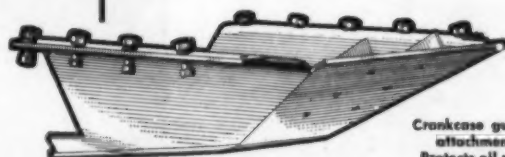
Sprocket rock deflector. One for each side.



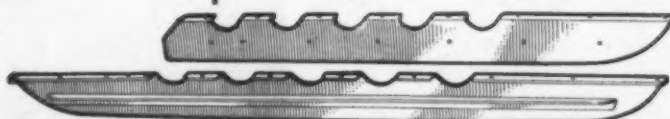
Radiator guard. Extra toughness for extra tough work.



Front pull hook attachment. Handy in many ways.



Crankcase guard attachment. Protects oil pan.



Heavy duty track roller shield attachment.

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# INTERNATIONAL Industrial Power



## Building Approach To Lincoln Tunnel

(Continued from page 2)

of woven cotton asphalt-impregnated fabric, applied to and mopped with hot asphalt, and one course of brick laid in mastic on the fabric. For the sides, two layers of membrane and 8 inches of brick in mastic were placed as waterproofing. The concrete for the structure was placed directly on the waterproofing.

The concrete for the entire job was furnished by the McCormack Transit-Mix Concrete Co., of New York City and delivered to a hopper and thence to an elephant trunk to the invert or wall sections. The concrete crew for the invert generally consisted of top and bottom chute men, three shovelers and a foreman. The invert, which forms the bottom of the fresh-air duct, is a parabola with a span of about 16 feet and a vertical height of 6 feet. To insure a uniform flow of air without eddy currents, great care was taken in the alignment and finishing of the invert. The contractor developed a novel set of templates which were carefully lined up. The templates consisted of angles spanning the invert and supporting a T bar heated and bent to the exact contour of the invert. To stiffen this further, an A-frame was welded to the curved section and the horizontal section. These frames were set up at 10-foot intervals and used with 12-foot straight-edges to strike off the invert accurately. The concrete was vibrated before hand screeding and then given a smooth finish by hand floating.

The roadway is 21 feet 6 inches wide and consists of a 14 to 15-inch reinforced-concrete slab of 4,000-pound concrete. The road slab is reinforced with 10-inch I beams spaced 20 inches on centers, with  $\frac{3}{4}$ -inch round rods running longitudinally below and  $\frac{1}{2}$ -inch square deformed rods above the beams, and  $\frac{1}{2}$ -inch square rods placed transversely top and bottom in the slab midway between the beams. The roadway was poured in 50-foot sections and adjacent sections were poured every 48 hours. On this job all concrete was poured contiguous except the protection concrete for the invert which was poured in alternate 10-foot sections.

Immediately above the invert are the

haunches or fresh-air duct side walls which are poured at the rate of 30 feet per day. A novelty in the handling of this work was setting  $\frac{1}{2}$ -inch bolts in the roadway 8 inches from the edge and spaced 5 feet apart for bracing the form work for the lower section of the walls.

### The Steel-Bent Section

The connecting section between the open plaza and the completed portion of the tunnel consists of 134 steel bents generally spaced 5 feet center to center. Most of the columns are 12-inch Carnegie H-beam sections varying from 120 pounds to 64 pounds per foot. Instead of setting the base plates, which were welded directly to the columns, on a concrete pad to grade, the contractor insured the proper setting by placing the bearing plates on two 1-inch angles each about 15 inches long, previously set to grade. After the columns were erected and the ceiling and roof beams riveted, the space between the angles and the bearing plate was hand-grouted.

At the easterly 59 bents, because of

the low headroom between the street and the roof of the steel-bent section, the exhaust air duct is located on the south side of the tunnel instead of overhead. Exhaust air ducts in this area are located between the roof beams above the ceiling and are connected to the main duct on the south side of the tunnel. In the westerly portion, the exhaust air duct is above the roadway. Between Bents 7, the most westerly bent, and Bent 75, the ceiling beams are Carnegie CB subway column sections weighing 50 and 60 pounds per foot. The roof beams in these limits are 36-inch 230 to 160-pound Carnegie beams. From Bent 75 east, no ceiling beams are used and the roof beams vary from a 33-inch CB 141-pound beam to 36-inch CB 230-pound beams, with occasional built-up 24 and 21-inch CB beams with cover plates.

### Safety and Accuracy

At badly jointed rock and faults in the 670 feet of steel-bent section, the contractor drilled holes in the rock, using a 2-inch bit, and then drove in with

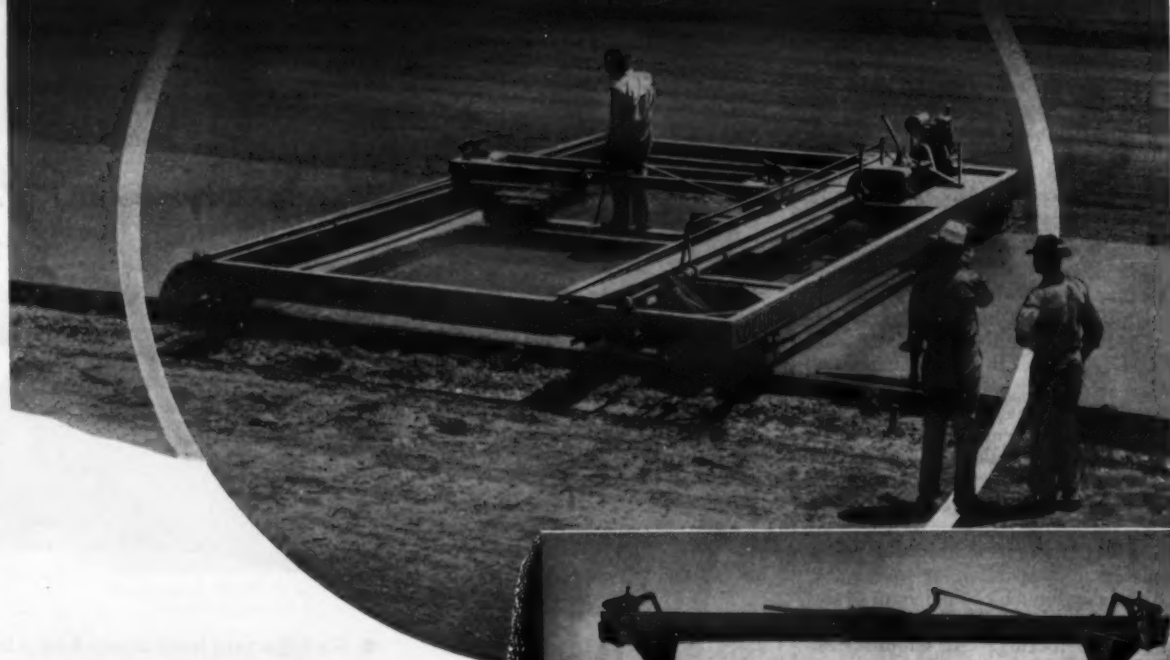
hand sledges 2-inch steel dowels which were then bent up against the overlying rock with the sledge to prevent rock from falling into the sections during construction.

A novel method of handling the form work for the wall section was used by the contractor. Rails with 8-foot gage were set on the invert and a wood jumbo with  $\frac{5}{8}$ -inch plywood side forms was run along the rail to pour 30-foot sections of the walls of the fresh-air duct.

All of the temporary steel girders for supporting Eleventh Avenue over the cut and also for the roadway support in front of a large meat-packing establishment located between Eleventh and Twelfth Avenues were from old elevated railway structures which have been removed in New York and Brooklyn in the past few years. The temporary columns for these girders were also from the same source. There is some satisfaction in the fact that not all of these elevated structures were shipped to Japan.

(Concluded on next page)

## ACCURATE SLAB FINISH CORRECTS SURFACE ERRORS.



## MECHANICAL FINISHING IS ACCURATE...

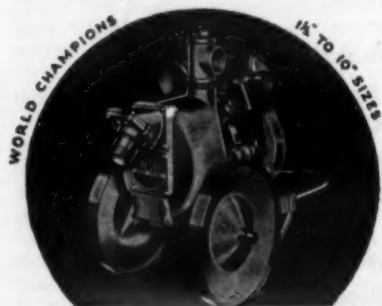
The Koehring Longitudinal Finisher finishes the slab surface in exact accordance with the crown specifications. Surface errors... excess or shortage of concrete affecting thickness of slab... are immediately detected because the Finisher screed accurately follows the crown of the slab. High spots are sheared and low spots filled. Correction of surface can be made with saving of concrete. Mechanical finishing with the Longitudinal Finisher is possible after initial set has occurred. Correct timing assures a smooth, accurate finish.

KOEHRING COMPANY, Milwaukee, Wis.

Carriage and screed travel along specified crown as controlled by carriage wheels on the template tracks. True contour of the slab is assured by this mechanical method. Slab thickness errors are quickly detected.



## HEAVY-DUTY CONSTRUCTION EQUIPMENT



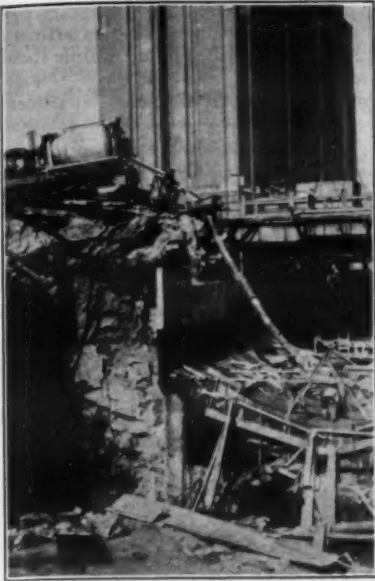
## Only JAEGER Pumps Have All These Features

- JAEGER PRIMING JET—Up to 5 times faster prime and re-prime—no adjustments, no need to "gun" engine.
- POSITIVE RECIRCULATION CUT-OFF—controlled by flow, not pressure.
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- EVERY PUMP FACTORY TESTED for high capacity and pressure.
- COMPLETE RANGE OF SIZES, TYPES—3,000 to 240,000 g.p.h.

Send Today for Latest Catalog and Prices.

THE JAEGER MACHINE CO.  
781 Dublin Ave., Columbus, Ohio





C. & E. M. Photo  
Concreting the fresh air duct invert at the east end of the steel-bent section of the Lincoln Tunnel.

## Second Tunnel Tube Nearing Completion

(Continued from preceding page)

A considerable amount of fire hose was used around the job and the contractor found that the only way to keep this new fire hose for his water connections was to paint the brass couplings green to make them look old. It was remarkable how little of the "camouflaged" new hose disappeared from the job, while obviously new hose practically evaporated.

### Major Equipment

For handling rock and lumber the contractor rented a Lorain crane mounted on an 8-wheel Mack truck and a Lorain crawler crane from Elmhurst Contracting Co. One of the contractor's own Northwest crawler cranes was also used for handling steel for the bents.

The air compressor outfit was located on a lot adjacent to Eleventh Avenue and consisted of one 700-cubic foot Chicago-Pneumatic compressor with a C-P diesel engine and a 500-cubic foot Chicago-Pneumatic compressor with a Caterpillar diesel engine. Adjacent to these two portables was a shed housing an I-R oil-heating furnace, an I-R drill sharpener and a large steel tank for quenching the Crucible drill steel. The foreman of the drill shop reported that up to 400 bits were sharpened and tempered per 8-hour day. The contractor

maintained several Kadco dust collectors on the job to protect jackhammer operators from the fine drill dust.

### Personnel

The new Manhattan approach to the Lincoln Tunnel is being built by the Port of New York Authority under the direction of J. C. Evans, Chief Engineer, with Charles L. Crandall, Superintendent of Construction, and George J. Brenner as Resident Engineer. Ralph Smillie is Engineer of Design. Both contracts for the work were awarded to George J. Atwell Foundation Corp. of New York City, for whom Robert Brennan is General Superintendent and J. M. Kyle is Project Engineer on this work.

## Second Volume Issued On Highway Practice

Volume II of "American Highway Practice" by Laurence Hsley Hewes, M. Am. Soc. C. E., and Chief, Western Region, Public Roads Administration,

has just been published. This volume deals with the various types of bituminous paving, the design and construction of concrete highways, brick roads, and miscellaneous highway structures such as small bridges, various types of culverts, grade-separation structures and protection devices, and special structures.

Together these two volumes cover the entire field of American highway practice, as the first volume discusses the subjects of highway location and design, grading, base construction, roadside development and low-cost and intermediate types of surfacing.

Each chapter in each volume is concluded with a summary of the subject under discussion and a well selected bibliography including references to magazines, books and papers in association proceedings.

Copies of Volume II of "American Highway Practice" may be secured by interested contractors and engineers direct from John Wiley & Sons, 440 Fourth Ave., New York City, or from

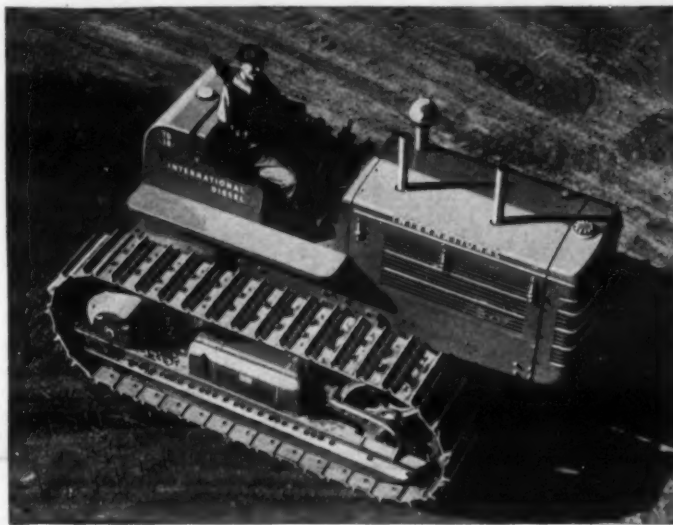
this magazine. Price: \$6.00. The two volumes are available at a price of \$11.00.

## Cement Co. Officials Die

The Universal Atlas Cement Co., New York City, sustained the loss of two members of its staff through sudden death last month. On August 15, Leonard Wesson, Operating Manager, died of a cerebral hemorrhage, and on August 17, Frederick Lee Stone, Vice President, died suddenly.

Mr. Stone began his career in the cement business as a salesman with Universal Atlas in 1911. In 1928 he became General Sales Manager, was elected a Vice President in 1932, and a Director in 1938.

Mr. Wesson was associated with both the Universal Portland Cement Co. and the Atlas Portland Cement Co. and when the two companies joined in 1930, he became Assistant Operating Manager, advancing to the position of Operating Manager in 1937.



## MAKE YOUR TRACTRAC TOR EXTRA TOUGH WITH THESE VICTORY ATTACHMENTS

MACHINES take an extra dose of bruising in times like these. There's vital work to do—and it must be done now! If you operate an International TracTracTor, your hauling, pushing, and pulling is being handled by one of the toughest things that crawls. It's good to know your tractor can take punishment without being babied every step of the way. And here is something else that's good to know! You can make your TracTracTor extra tough and do extra hours of work every day with the help of International Victory attachments.

What are Victory attachments? Take a look at the drawings on this page. These attachments are added to TracTracTors built for the Victory Pool, released to eligible users by the WPB. You can bring your TracTracTor up to Victory specifications by ordering the attachments you need. See the nearest International Industrial Power dealer.

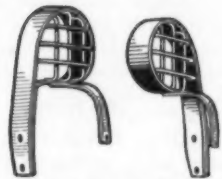
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180 North Michigan Avenue Chicago, Illinois



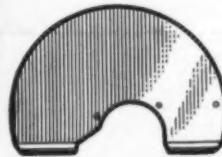
Exhaust muffler attachment.



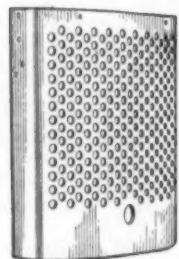
Head lamps. Permits night work.



Head lamp guards. Protects lamps from breakage.



Front idler shield attachment. Prevents damage from stones.



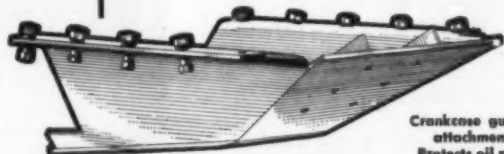
Radiator guard. Extra toughness for extra tough work.



Sprocket rock deflector. One for each side.



Front pull hook attachment. Handy in many ways.



Crankcase guard attachment. Protects oil pan.



Heavy duty track roller shield attachment.

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Distributors in Principal Cities

# INTERNATIONAL Industrial Power

## Work Already Begun On Route to Alaska

**This Much-Discussed 1,400-Mile Road Will Be Longest Single Highway Ever Built for Peace or War**

† AT last the highway to Alaska, promoted for the past 10 years for its trade, development and tourist possibilities, is to become a reality to serve the grim necessities of war.

The United States and Canadian Governments have agreed on the fundamentals of the arrangements, and the Corps of Engineers are already at work putting through the pioneer road. Under the agreement, Canada will acquire the necessary rights-of-way; the United States will construct the road, under contracts with U. S. or Canadian contractors, and will maintain it for the duration of the war and six months thereafter; following which the highway will become an integral part of the Canadian highway system, with Canada responsible for its maintenance.

During the period of construction, Canada will waive import duties on all shipments of materials and equipment from the United States for use on the highway, as well as on the personal belongings of the construction personnel; and will also facilitate the entry of U. S. citizens into Canada for the purpose of employment in the construction of the highway.

### The Route

A number of routes for the Alaska Highway have been contemplated, but latest reports seem to indicate that the route adopted will lie somewhat east of the routes proposed earlier, because of the greater protection from air attack, easy grades, favorable climatic conditions, and because it lies along the line of the air route to Alaska. The road will begin at Dawson Creek, which already is connected by highway and railroad with Edmonton, and will continue to Fort St. John, Fort Nelson, Watson Lake, and connect with the Richardson Highway south of Fairbanks, Alaska.

### Work Under Way

The pioneer road is already under construction by the Army Engineer Corps and large quantities of men and equipment have been moved in by railroad and tractor train. Because of the muskeg on the existing trail road, which is usable only when frozen, sufficient supplies for all summer had to be moved in before the spring thaw. The completion of the pioneer road will make it possible for work to go on simultaneously along the entire route.

The Public Roads Administration is now engaged in surveys for the final location of the highway, and several engineering management contracts have been let by the PRA. Construction contractors will be recruited by the management contractors and, if satisfactory to the Public Roads Administration, the management contracts provide that "the Government will enter into separate construction contracts with each of them for such portion of the project as may be deemed necessary to insure completion within the shortest possible time." Construction contracts are to be on a "fixed-fee" basis.

Services of the management contractors will be "subject at all times to the direction and approval of the District Engineer of the Public Roads Administration," the management contracts further state.

Each management contractor is to maintain a central office on the project and will directly manage and control the construction contractors and their operations on a section of highway. Each management contractor is also to

supervise and operate a central equipment repair depot, a central storage and supply depot, and necessary camps to provide board and lodging for all personnel on a section of the highway.

### Personnel

Brigadier General William M. Hoge, Corps of Engineers, U.S.A., is in charge of the work on the pioneer road from Watson Lake to a connection with the Richardson Highway in Alaska, and Colonel J. A. O'Connor will have charge

of the pioneer road work south of Watson Lake.

Work of the Public Roads Administration on the project is directed by J. S. Bright, with headquarters at 303 Hoge Bldg., Seattle, Wash. Project offices have been established at Edmonton and Whitehorse to supervise the construction of the highway. Levant Brown, Construction Engineer from the PRA San Francisco Office, is in charge of the Edmonton Office, and F. E. Andrews, Construction Engineer, is in charge of the

Whitehorse Office.

The material on which this article is based was furnished by the Public Roads Administration and has been released for publication by the War Department.

*Fire Prevention Week will be observed from October 4 to 10. Fire is always serious, but now every loss of life, every interference with production, every loss of critical materials delays Victory. Don't let carelessness work for the enemy.*

**Speeding Victory**

**Barber-Greene**

**THESE** machines are the free enterprise, developed in times of normal functions. They are typical ingenious results of the open competitive system. Now these very same machines are working to defend the system as possible.

There is much more to defense than the building of camps, airports, roads.

**BARBER-GREENE CO.**

**B-G FINISHER** — This machine is used for finishing the surface of the road. It is a self-propelled machine with a large rotating drum that spreads and compacts the material.

**B-G PORTABLE CONVEYOR** — This machine is used for transporting material from one place to another. It is a self-propelled machine with a long, adjustable conveyor belt.

**B-G "GOOSENECK" COAL LOADER** — This machine is used for loading coal into trucks or trains. It is a self-propelled machine with a long, adjustable boom that can reach over the side of a vehicle.

**B-G CAR UNLOADER** — This machine is used for unloading material from trucks or cars. It is a self-propelled machine with a large, adjustable hopper that can dump the material into a container.



# Line of Tractor Shovels

## Described in New Catalog

"Let's Dig In and Win" is the title of a new bulletin recently issued by the Trackson Co., 3333 So. Chase Ave., Milwaukee, Wis., featuring the use of Traxcavators on a variety of excavating jobs. Interesting action photographs show these heavy-duty tractor excavating and loading machines digging and moving dirt for the construction of airports, defense plants, oil pipe lines and high-

ways. Included also are mechanical views and specifications of the three models, T2, T4 and T7, and other action views show Traxcavators digging in tough soils, loading the excavated material directly into trucks and wagons, carrying the loads to the hauling units and to the fill; piling, casting, spreading and backfilling.

Mounted on Caterpillar track-type tractors, these units are, it is claimed, "digging for Victory on world-wide fronts." Copies of this bulletin may be

obtained by writing direct to the Trackson Co. and mentioning CONTRACTORS AND ENGINEERS MONTHLY.

## Mexican Highway Program

Mexico's Ministry of Communications has announced the biggest road-building program in Mexican history, to be undertaken with United States financial aid in order to facilitate raw material shipments to this country for war production. According to a release from the

Office of Coordinator of Inter-American Affairs, the program will be financed by a \$30,000,000 loan from the Export-Import Bank, Washington, D. C., plus several million dollars which Mexico will receive from the new lend-lease agreement.

A network of hundreds of miles of new roads will be built, linking Mexico's east and west coasts, and connecting with Arizona and New Mexico. The plans also call for completion of the Inter-American Highway to Guatemala.

Deletion made by Barber-Greene Company to comply with current censorship.

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— a thousand major products — requiring almost every commodity used in our normal life — now required in a sudden rush of multiplied quantities. The ingenuity and unequalled efficiency of American products combined with the American spirit is responsible for the rapid progress of the defense program — a spirit that is showing the difference between being pushed together, and pulling together.

AURORA, ILLINOIS, U. S. A.

B-G BITUMINOUS CENTRAL PLANT



B-G PERMANENT CONVEYORS



B-G DITCHER



B-G BUCKET LOADER

B-G COAL LOADERS



## Dredged Shells Used For Rural Road Base

**Local Material Provides 7-Inch Compacted Base In Most Densely Populated Rural Area in U. S.**

† LOUISIANA Highway 78 runs on the west side of Bayou Lafourche south from Raceland through one of the most densely populated rural areas in the United States, the majority of the people living on the high ground adjacent to the bayou. The farms in this vicinity, which are used principally for the production of sugar cane, for this is a part of the Louisiana Sugar Bowl, are divided in such a way as to give everyone a frontage on the bayou, and many of them are only half an arpent\* in front and from 40 to 80 arpents in depth. On the lowlands back of the farms and plantations, the trapping of muskrat, mink, and raccoon is carried on very extensively during the autumn and winter trapping season. The nearby Gulf of Mexico provides excellent fishing and shrimping grounds.

The only economically available aggregate for road construction in this section is clamshells from Lake Salvador about 17 miles to the east. As both the lake and the bayou are on the Intracoastal Canal, transportation is by barge.

During the summer of 1941, a contract was awarded to the R. B. Tyler Co. of Louisville, Ky., for the construction of 8.59 miles of 7-inch compacted shell base with a 3-course bituminous treatment top on Route 78, beginning 6 miles south of the town of Lockport.

### Reconstructed Base Course

All irregularities and depressions in the old surfacing were removed by scarifying and blading in order to provide a smooth and uniform foundation for the new clamshell base. Clamshells powder under rolling and traffic, the powdered shell serving as a bonding material. In some cases silt was spread over the shell to improve the bonding. The road ditches were cleaned, should-

ders dressed, and the surplus material used to build shoulders and retain the new shell base which is 19 feet wide at the top and 21 feet wide at the bottom.

### Delivering the Shell

The shells for this job, as well as for practically all other work of this type within a radius of 50 miles, were dredged from the great deposits in Lake Salvador and transported by barge through the Intracoastal Canal to Bayou Lafourche. The shells were furnished by Jahncke Service, of New Orleans, and unloaded from the barges to a steel loading hopper continuously by the Jahncke derrick barge Ajax with a 1½-yard clamshell bucket. A fleet of four trucks, hauling 5 yards of clamshells per load in built-up bodies, were quickly loaded



C. & E. M. Photo  
Unloading clamshells from barges on the Intracoastal Canal south of Raceland, La., on an R. B. Tyler Co. contract.

at the hopper. When the combination of delivery by the barges and unloading by the derrick was running smoothly, and with a moderate hauling distance of not more than a mile, the derrick unloaded and the trucks hauled out to the

road about 1,200 yards of clamshells in 10 hours.

### Placing and Compacting

Dumping with the body hoisted about  
(Concluded on next page)

*Drafted for U.S. Service  
at TVA's FONTANA DAM!*



Famous Smith Tiling Mixer—the last word in concrete mixer design and construction.

## FIVE SMITH 4-YARD TILTERS

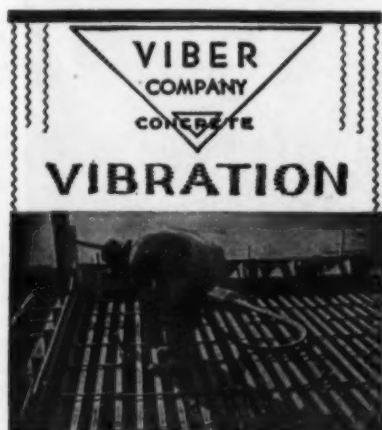
are slated to pour the 2,650,000 yards of concrete required for TVA's new Fontana Dam at Little Tennessee River, North Carolina. Smith Tilters were selected for this important war project because of their proven ability to produce uniform concrete on a fast, efficient, production basis. For more than 40 years, Smiths have set the pace for concrete mixers on big engineering projects: Boulder Dam, Tygart Valley Reservoir, Watts Bar Dam, Cherokee Dam, and many others.

New, improved Smith Tilter features include: All-welded box girder pedestals and tilting frame; heat treated, high-carbon steel roller track, drum gear and pinion with machine cut teeth; forged, heat-treated edge rollers and main rollers; 60° drum tilt with automatic pneumatic tilting unit; fully enclosed machine cut spur gear transmission unit with splined alloy steel shafts; direct connected, 75 hp. electric motor drive. All sizes available. Write for full particulars.

The T. L. SMITH CO., 2857 N. 32nd St., Milwaukee, Wis., U. S. A.



**SMITH MIXERS**  
USED ON THE WORLD'S GREATEST CONCRETE PROJECTS



### MOST PROFITABLE FOR REINFORCED CONCRETE BUILDING CONSTRUCTION

When the job calls for mass vibration—the Viber Vibrator at work above is your best bet. Especially made for walls over 10 inches thick, foundations, large girders, thick floor slabs, columns, large reinforced concrete bridges, grade separations, concrete floor systems, concrete arches and rigid frame structures. . . In a word, for all concrete with large aggregate and low water-cement ratio.

Write for complete VIBER data TODAY!

**VIBER COMPANY**  
728 So. Flower  
BURBANK, CALIF.



## Clamshells for Base On Louisiana Highway

(Continued from preceding page)

20 degrees and with the tail-gate open, the operators were sufficiently skilled to run the truck at the right speed so that the load was deposited with unusual accuracy between the stakes set along the road to indicate the spread for each truck. The material was then spread uniformly against the windrow and toward the center of the road by a Caterpillar 44 grader pulled by an International TD-14 tractor. The grader was equipped with extra-wide steel wheels, with 14-inch treads to permit easy pulling over the rounded shells during the first part of the blading.

Inasmuch as there was insufficient time to complete the surfacing with a triple-application bituminous wearing surface before the beginning of the cane hauling and grinding season, the project was maintained as a shell road by wetting, blading, and rolling by a 10-ton 3-wheel roller until the completion of the cane harvesting.

### Personnel

The placing of this new 7-inch compacted shell base on 8.59 miles of Louisiana Route 78 on the west side of Bayou Lafourche was awarded to R. B. Tyler Co., of Louisville, Ky., as State Project 64-05-03. Henry Cox was Superintendent for the contractor on this work.

For the Louisiana Department of Highways, the work was done under the direction of Lester Corley, District Engineer, at Marrero, and J. H. Drake, Resident Engineer, located at Lockport.

### Contractor to Build 13 Concrete Ships

A contract for thirteen huge concrete barges, built to the shape of ships and designed for ocean travel, has recently been awarded by the U. S. Maritime Commission to Barrett & Hilp, general contractor, of San Francisco. Concrete ships were tried out in World War I but did not prove satisfactory. However, the art of concrete handling has advanced so far during the past 20 years that it is possible to build concrete hulls which are much lighter in weight and will be satisfactory for ocean service.

Instead of building the barges on ways and launching them, Barrett & Hilp will employ a basin method of construction. Each basin will be excavated to a depth well below the water of San Francisco Bay and closed off by huge gates. When a barge is completed, the gates will be opened and the barge floated out into the Bay.

According to the contractor, this plan will save much time and thus speed up considerably a very essential job.

### Highway Industry and War

The highway industry and profession can justifiably point with pride to its share in the war effort. No other business was better prepared to undertake essential defense and war work without

delay. No other business can show a better record of completion of assignments on or ahead of time. No other business will do a better job of speeding future war projects. The highway industry and profession is an effective example of the success of the American system of free enterprise in placing strong support behind the men behind the guns.

From "Down the Road," by Charles M. Upham, Engineer-Director, American Road Builders' Association.

### National Safety Congress

The thirty-first National Safety Congress and Exposition will be held October 27-29, 1942, in the Hotels Sherman, La Salle and Morrison in Chicago. Former plans to hold the Congress at the Stevens and Congress Hotels have had to be changed because these latter hotels have been taken over for military purposes.

This change in no way affects the size, scope and importance of the Congress which will include 200 sessions, with 500 program participants.

In Any WEATHER  
...AnyWHERE,  
*Sterling*  
WHEELBARROWS Work!



For Nearly 40 Years,

Sterling Wheelbarrow performance has proved that Sterlings can always be depended upon to deliver capacity results, regardless of climate or location. Any man-power, anywhere, can produce when Sterlings are on the job... no experts or trained help required for peak results. Today... all over the country, Sterlings are proving indispensable in the nation's efforts to speed production, conserve materials and win the war. Tomorrow... after peace has been restored, Sterlings will again be available, in all styles and capacities, to help in the reconstruction work.

STERLING WHEELBARROW CO., MILWAUKEE, WIS.

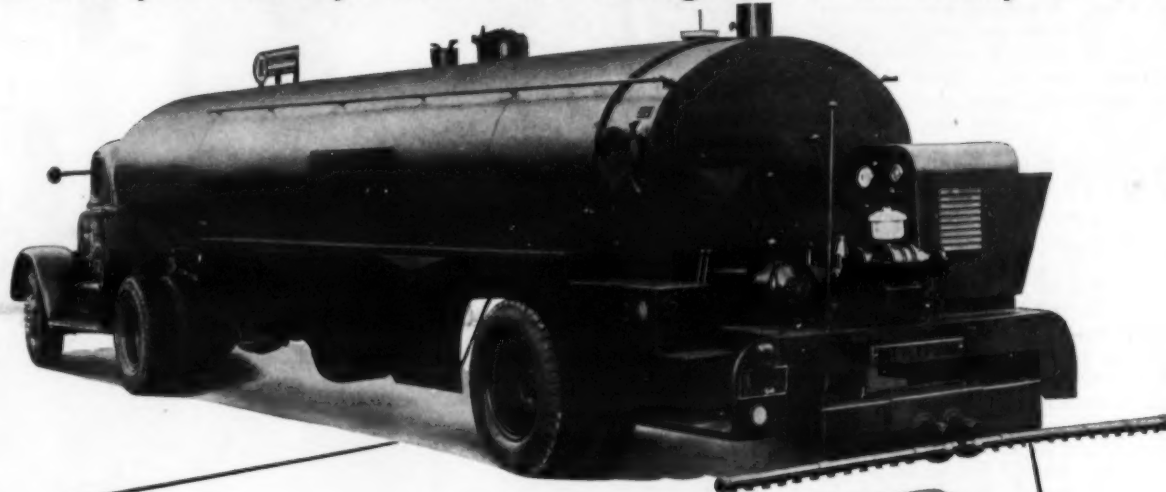
*Sterling*  
WHEELBARROWS



Look for this Mark of  
STERLING Quality

A 3821-1/3

## CONSTRUCT and MAINTAIN those Strategic Highways and Airport Runways with Units Having Proven Efficiency . . .



**"SPRAY MASTER"**  
**PRESSURE DISTRIBUTORS**—For applying Tar or Asphalt to a Highway or Airport Runway, up to 24 feet in width, the "Spray Master" is the most economical. It operates with simplicity, as a Single Valve controls the spray. Made in sizes from 800 to 4000 gallons.

**LITTLEFORD ROAD BROOMS**—Before applying Tar or Asphalt to a surface, a Littleford Road Broom should be used to sweep off dust and dirt to assure perfect binding of the added materials. Littleford Brooms are designed for modern work. Made in Power Driven or Traction Driven Two-Way Models.



**LITTLEFORD SUPPLY TANKS**—For Hauling Tar or Asphalt to the job, a Littleford Supply Tank can speed up construction. These Supply Tanks supply the Pressure Distributors with materials, keeping the Distributors on the job. Made in two models by Frameless Construction method. Sizes from 1250 to 4000 gallons.

**"TANKAR" HEATER**—For unloading tank cars of tar or asphalt, the Littleford "Tankar" Heater is capable of heating in 1/4 less time than ordinary units. Can be used for steam cleaning, also.

WRITE for Catalog R. All Littleford Black Top Equipment is illustrated. Keep it handy for ordering Black Top Construction or Maintenance Equipment.



**LITTLEFORD**

LITTLEFORD BROS., INC.  
485 E. PEARL ST., CINCINNATI, OHIO, U. S. A.

**C.H.&E.**

Saw Rigs  
Pumps  
Rollers

C. H. & E. MANUFACTURING CO.  
2810 No. Palmer St. Milwaukee, Wis.



Protection against dust, dirt and scale in compressed air lines through the use of a filter extends their service life.

### Air-Line Protection From Dust and Dirt

The protection of compressed air lines from the ravages of dust, dirt and scale has always been important to the efficient and economical operation of air tools. Keeping dirt out of valuable pneumatic equipment not only prevents clogging but will prolong the life of these practically irreplaceable tools.

CCA filters for removing sludge, dust, sand, rust scale and moisture from compressed-air lines are available in three types: Type 1, for use with any standard snap-on hose coupling; Type 2 for a line filter; and Type 3, for a line or under-bench filter. It is stated that centrifugal action removes 90 per cent of the dirt from the air before it goes through the felt glove of the filter. Then, as the air in the filter whirls, water, scale, sand and dirt are thrown to the side walls and then drain or fall to the bottom of the bowl. When the drain valve is opened, high air velocity blows out all dirt and moisture, skims the dirt off the side walls of the bowl, and also removes the large particles of scale and grit from the glove.

To service the felt filter gloves, the bowl is unbolted and removed from the head casting without disconnecting the filter from the line, then the cage which holds the felt glove can be unscrewed and the glove replaced if necessary. Frequency of servicing depends upon operating conditions and the volume of air passing through the filter. The manufacturer recommends that the filter glove be inspected after the first three months of operation, and then a regular servicing period set up on the basis of the findings at the first servicing.

A new folder, entitled "Dirt, Drip, Scale Are Axis Agents, Too" and de-

scribing and illustrating the CCA filters, may be secured by those interested direct from Filters, Inc., 1515 Gardena Ave., Glendale, Calif., by referring to this item.

### Changes in Officials At Marmon-Herrington

The rapid growth of operations of the Marmon-Herrington Co., Indianapolis, Ind., has necessitated a reorganization of the company, giving recognition to a group of executives, many of whom have been with the company for a number of years and who have played an important part in its development.

Under the new organization, Bert Dingley, former Executive Vice President, becomes President, with the following Vice Presidents to assist him: R. C. Wallace, in charge of engineering; Seth Klein, in charge of production; C. Alfred Campbell, in charge of public relations; and George E. Reynolds, in charge of the Eastern District.

William P. Nottingham has been

elected Secretary and H. De Baun Treasurer to succeed D. I. Glossbrenner, who resigned the dual offices of Secretary-Treasurer to enter military service. John J. Klein, Assistant to Mr. Herrington, is now Assistant Secretary and L. M. O'Connor, Assistant Treasurer.

Mr. Herrington, who continues as Chairman of the Board of Directors, is spending much of his time in Washington and New York, attending to the varied interests of the company there. The Marmon-Herrington Co. is now engaged in the production of all-wheel-drive trucks, armored cars, track-laying tractors and tanks for use by the Allies.

### New Buda Field Man

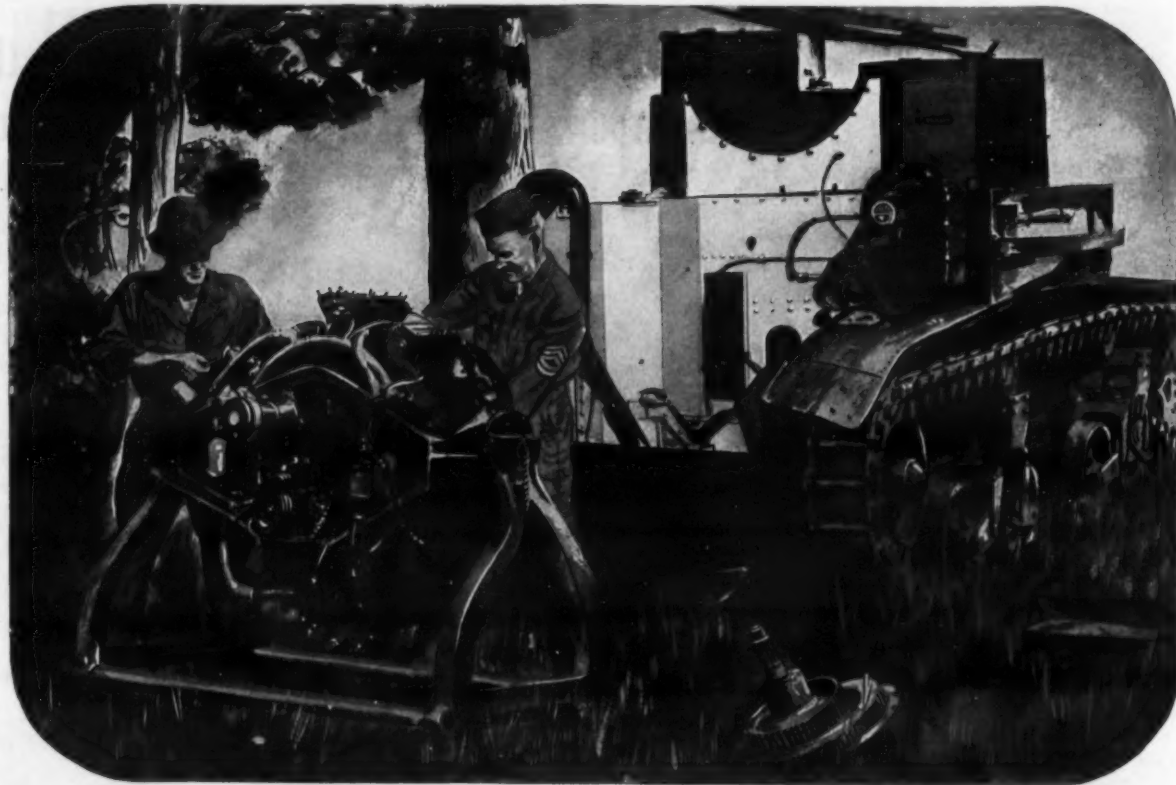
The Buda Co., Harvey, Ill., manufacturer of diesel and gasoline engines, lifting jacks and railway equipment, announced recently that Frank M. Boylan has joined its organization as a field representative in the Industrial Division, handling railroad products and lifting jacks.

### A-C Welding Rod For All-Position Use

A new electrode designed specifically for all-position welding of mild steel with the alternating-current type of welding machines has recently been announced by the Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York City. Made in 1/16, 3/32, 1/8 and 5/32-inch diameters, this Wilson No. 530 electrode complies with all requirements of the American Welding Society Classification E6011 and other specifications qualifying it for use on war work, the manufacturer states.

Results of tests demonstrate that with this electrode average operators have no difficulty in securing good fusion and complete penetration. The finished weld deposit is quite smooth and has a uniform surface contour.

Further information on this new electrode may be secured by those interested direct from the manufacturer by mentioning CONTRACTORS AND ENGINEERS MONTHLY.



## His old job IS YOUR JOB NOW

● That boy who had the knack of keeping even your most overworked machine "ticking" is probably now using that knack in the interest of Uncle Sam. Yet never before has it been so important to keep your equipment working at top efficiency.

You who own Austin-Western equipment have the advantage of the extra durability that's built into it. You don't have to baby A-W machines. But you can't hope to get the most out of even the most rugged machines unless you have them serviced promptly and regularly... by men who know exactly what to do... when and where to do it.

Your nearby A-W dealer has this know-how... and the equipment to do a thorough job with a minimum of lay-up time for the machines. Consult him for helpful, constructive suggestions on simple service steps that will prevent many breakdowns, and help keep old machinery performing with new machine efficiency. THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois.

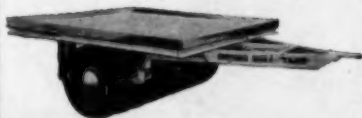


CONSULT YOUR NEARBY A-W  
DEALER FOR ADVICE ON CON-  
SERVING YOUR MACHINERY

## Austin-Western

MOTOR GRADERS • BLADE GRADERS • ELEVATING GRADERS • SCRAPERS • CRUSHING AND SCREENING PLANTS • ROLLERS  
ROLL-A-PLANES • MOTOR SWEEPERS • SHOVELS AND CRANES • SCARIFIERS • DUMP CARS • TRAIL CARS

### ROLL-TAMP



This most talked about rubber-tired roller on the market. The ROLL-TAMP offers the buyer more real value. It excels the field through its uniform rolling pressure—Fewer passes are required and gone are hard and soft spots in the compacted area—More effective and less costly because it saves time—Patented walking beam—Radial axle wheel mountings, adjustable height drawbar and dual supporting stanchions make this Roll Tamp a most desirable piece of equipment.

Please write for descriptive bulletin MP-112B.

**MADSEN**  
IRON WORKS  
HUNTINGTON PARK, CALIFORNIA



# Concrete Surfacing Widens Old Pavement

**Hornell Const. Co. Used a Dual Batching System With Two Sands for Two-Course Concrete Near Corning, N.Y.**

(Photos on page 52)

BECAUSE local sand is unsatisfactory for the wearing surface of concrete pavements and for structure concrete work in the Binghamton-Hornell-Corning, N.Y., area, most concrete paving and structural contracts require the use of sand from as much as 200 miles distant, usually Boonville or Irving sand. This specification of the New York Department of Public Works for highway paving requires a sand with not more than 6 per cent kaolin nor less than 75 per cent of quartz plus feldspar, as shown by rational analyses, with the permitted use of local sand for the bottom 4½ inches of a 7-inch pavement. But the high-grade sand must be used for the 2½-inch surface course.

The contract for resurfacing an old 18-foot reinforced-concrete pavement with a new 7-inch reinforced-concrete surface widened to 22 feet, with 9-inch concrete 2 feet wide on either side, was awarded to the Hornell Construction Co. of Hornell, N.Y., and was completed during the summer of 1941. The work extended for 1.71 miles west toward Corning from the Village of Big Flats on N. Y. 17.

## Preparation for Resurfacing

Where the old pavement was too badly broken, it was completely removed and an 8-inch uniform-thickness pavement laid to replace it. About 180 feet of banked curve at one point and 300 feet at another were completely removed.

The 2-foot widening strip outside the old pavement was cored out by a Caterpillar No. 12 Auto Patrol and then thoroughly compacted by a 7-ton Buffalo-Springfield 3-wheel roller. In isolated instances where the grade was low and had to be made up after the initial rolling, the widening strip was re-rolled, and hand-tamped with a wood block adjacent to the forms where inaccessible to the roller. This strip was given its finish grading by a crew of four men who checked the depth with a template running on the old pavement and on the forms which were set on wood planks to make up for the additional depth of concrete outside the old pavement.

The contractor maintained a large locked tool box on the grade just ahead of operations for all hand tools and the storage of some small materials, such as pins. The tool box was mounted on automobile axles and rubber tires so as to be moved readily and kept ahead of operations.



## Concrete VIBRATORS AND GRINDERS

Write for Circular on types, sizes and prices

**White Mfg. Co.**  
ELKHART INDIANA

All holes in the old pavement were filled and the joints poured with asphalt prior to paving. A large Littleford rubber-tired asphalt kettle heated with an L-B torch was used to supply the hot asphalt for pouring joints. Medium-size holes which were not sufficiently bad to require the removal of the concrete were filled with a cold-laid bituminous mixture, while the smallest holes were merely broomed out and filled with concrete as part of the paving operation.

Inasmuch as the center forms for the first strip of concrete poured had to be set on the old reinforced-concrete pavement, it was necessary to drill stake holes and also holes for the pins to support the expansion joint during pouring. An Ingersoll-Rand 2-wheel trailer compressor, driven by a Waukesha motor,



C. & E. M. Photo

Pouring concrete on one side of a new expansion joint set on top of old concrete slab on a highway widening job near Corning, N. Y.

was pulled along the pavement by hand to operate an I-R Jackhammer with detachable bits for this purpose. On the widening strip two men checked the

grade for the forms and two others set the forms. Only two were required when setting on the old pavement.

(Continued on page 48)

# A Message TO OWNERS AND OPERATORS OF ALL CONSTRUCTION EQUIPMENT

Winning the War depends on the maximum production of every individual and every piece of machine equipment in the United States. An hour lost today is an hour PERMANENTLY LOST—an hour which can never be regained.

You owe it to your country and yourself to keep your equipment working the greatest number of hours at MAXIMUM EFFICIENCY.

In order to MAINTAIN PEAK EFFICIENCY your machines MUST BE KEPT in FIRST CLASS CONDITION.

Because of the War's tremendous demand for critical materials there will be times when both dealer and manufacturer are unable to supply you immediately with certain repair parts.

Constant inspections by your dealer's trained servicemen or your mechanics will keep you informed of the condition of your machines. By anticipating your need for repair parts you will assist your dealer in his effort to maintain an adequate stock of repairs. By working closely with your dealer you may avoid the loss of valuable productive hours and the use of your machine for indefinite periods.

Guard against costly delays. Make rigid inspections of your equipment at regular intervals.

Talk to your dealer now about a regular schedule of planned inspections. Advise him of those parts you may need in the near future.

Anticipate the need of those parts which inspection shows will have to be replaced and then order them the minute you know what is needed to keep your equipment in first class operating condition.

*"Keep 'Em Rolling!"*

**THE CLEVELAND TRACTOR COMPANY**  
CLEVELAND, OHIO

## Road-Mix Retread For County Roads

(Continued from page 2)

rate of 0.25 gallon per square yard. The asphalt is purchased under contract, applied to the road. This prime is blotted at once with the graded aggregate which is to be used for the road surface, the blotter being about 3 inches thick. Experience in Macon County, according to Fritz L. Washburn, Chief Engineer, County Highway Department, has shown that there is less damage to the prime in covering it in this manner than there is through the inevitable use of the road by local traffic before the prime has cured.

The graded aggregate is shot as soon as possible with 1.25 to 1.35 gallons per square yard of SC-3, divided into two applications, and each time spread 9 feet wide at one side of the road and then back on the other side for an 18-foot road. In doing this work, up to 6 miles of road is under construction at one time, with the distributor continuing up one side of the road, applying its 9-foot strip of asphalt as far as the load will go. In this way the second side of the road is left for traffic without damage to the mixing operation or to the vehicles using the road.

Immediately behind the distributor the material is mixed by a Killefer double disk pulled by the county's 2-ton Caterpillar tractor or its Thirty tractor. Right behind the disks comes an Adams Retread Paver pulled by an RD8 tractor, taking a 9-foot cut 3 inches deep and running at about 2 miles per hour. With the distributor operating at about 4 miles an hour and having to leave the job for a refill, the Retread Paver catches up with the application of the asphalt. This operation is continued for the full length of the project laid out and is also continuous through the second shot of asphalt, completing the application of the 1.25 to 1.35 gallons per square yard. There is no blade mixing used in Macon County. The material is mixed continuously during daylight hours by the Retread Paver, requiring about 2 days of operation per mile of road. The material is always windrowed to the two sides of the road at night. If the operation is caught in the rain, the material is windrowed and when work starts again the windrows are spread out to dry before they are reworked.

The material is spread by the Retread Paver followed by a power grader which knocks down the center ridge between the two 9-foot spreads. After spreading, the material is rolled first by a steel wheel roller, a 10-ton 3-wheel unit operating at 7 miles per hour. This is done before the rubber-tired roller is put on, as it eliminates the ridges which are sometimes worked into the road by patrol tires and the pneumatic roller, as well as traffic using the road, as the road is open to traffic all of the time. The rolling for final compaction is completed by the rubber-tired roller. Every effort is bent to discourage traffic over the road during these construction operations although it is impossible to forbid traffic to use the roads.



C. & E. M. Photo  
State-Aid Road 20, west of Forsyth, Ill., surfaced with road mix by the forces of the Macon County Highway Department.

From one to three years after a 3-inch road-mixed mat is laid down, the road surface is sealed with 0.25 gallon per square yard of SC-3 asphalt over which is spread a sand blotter of 15 to 18 pounds per square yard as soon as the surface dries out. An agitator box with paddles beneath the box for spreading

the sand, made by Flink Equipment Co. of Streator, Ill., is used for applying the sand blotter. The machine is built to be driven by a chain from a sprocket attached to the axle of the rear wheel, but it has been found to operate better from the power take-off, inasmuch as it is impossible to operate the machine

backwards with the sprocket and chain. In order to insure ample material for later maintenance of a road-mixed section and also to take care of the few points difficult to mix where the road crosses a state highway, about 50 cubic yards of extra material are mixed at the end of a project and stockpiled at the side of the road.

Some road-mix work has been done with powdered asphalt, adding the flux to the aggregate and then, immediately after, adding the powdered asphalt and continuing the mixing. Adding 2 to 3 pounds per square yard additional to the top of the surface when it is spread gives an early seal and a denser surface. This type of work has now been suspended.

### The County Highway System

Within its 400 square miles, Macon County has 237 miles of road in the county system. There is a total of 1,116 miles of highways and roads in the county, consisting of about 112 miles

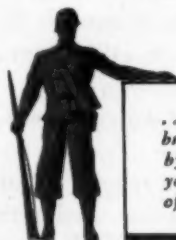
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*In the Spirit of Today*

## HEIL Peacetime Production Now Serves a Wartime Need





... you can depend on your Heil quality-built earth-moving equipment to stand by you for the duration ... provided you do your part by taking proper care of it NOW.

Heil hands that once produced equipment to fill your peace-time needs are now working tirelessly to produce more and more material of war, to help hasten the return of "business as usual."

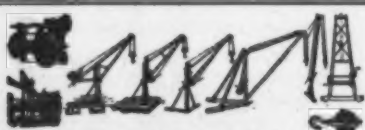
Result is, your present equipment will have to last you longer and work harder—unless you are fortunate enough to meet governmental requirements regulating the purchase of new equipment.

Protect yourself and your investment by keeping your Heil equipment in good operating condition. Rely on your Heil distributor for genuine repair parts and workmanship up to the Heil quality-built standards.

Wherever possible, help conserve materials by welding, reinforcing, rebushing, and rebuilding your present equipment—it is your patriotic duty, as well as excellent insurance against break-downs that may not only be costly, but irreparable.

While it is exceedingly difficult to provide you with new Heil Quality-Built Road Equipment "for the duration," it is our continued aim to provide you with the finest equipment to do a better job, quicker and at less cost, after the war.

Your Heil distributor is always ready to provide you with outstanding, prompt service on Heil Twin-Cable Scoops—Heil Hi-Speed Tractor Scoops—Heil Trailbuilders and Bulldozers—Heil Tamping Rollers—and Heil Hydraulic Dump Units. Call on him to help you keep your equipment operating.



Complete Line  
of  
DERRICKS  
and  
WINCHES

SARGEN DERRICK CO.  
3101 W. Grand Ave. Chicago, Ill.

## THE HEIL co.

GENERAL OFFICES • MILWAUKEE, WIS.



## County Equipment And Organization

(Continued from preceding page)

of state highways, the 237 miles of county roads and 767 miles of township roads. Of the 98 miles of county roads in the motor fuel tax system, 83 miles are bituminous surfaced, 9 miles are graveled and 6 miles have only an oiled earth surface. Of the balance of 139 miles of county roads 20 miles are bituminous-surfaced, 114 graveled, and 5 miles oiled earth. The county has nothing to do with either construction or maintenance of state highways within its borders.

The township highway departments are required to refer all purchases over \$200.00 for highway purposes to the County Superintendent of Highways for approval. The county maintains a general "grandfatherly" advisory attitude toward all township highway work.

### Organization and Financing

In Illinois, each county has a Board of Supervisors, of which there are 41 in Macon County, one from each of the seventeen townships and the balance from the cities, based on population. The city of Decatur has twenty-four supervisors. This Board appoints the County Superintendent of Highways, but the Board must have at least three applicants who are certified by the Board to the State Highway Department for a preliminary and a final examination. From those passing the final examination the Board may pick any candidate. The Chief Engineer in Macon County is hired by the County Superintendent of Highways. There is also a maintenance foreman, a bookkeeper and secretary making up the staff of the department, in addition to the Superintendent, Alan N. Buck. Mr. Buck is well known for his activities in the county highway field and in the County Highway Officials Division of the American Road Builders' Association.

A tax known as the Road and Bridge Tax is collected from all real estate in the county and brings a total of about \$60,000 annually. In addition Illinois counties receive 1-cent return from the state gas tax, pro-rated according to the automotive vehicle licenses issued in the county. This has added about \$150,000 annually to the road funds of Macon County. The 1 cent of the gas tax is given to the counties under a state law passed in 1929, requiring that this money must be spent under the supervision of the State Division of Highways on roads designated as on the county highway system. The money must be expended on projects set up for construction or maintenance.

### County Garage and Equipment

A repair garage for county equipment is located at the County Poor Farm about 3 miles northeast of Decatur. There is also a storage yard for equipment within the city limits. Maintenance equipment in use throughout the county is parked overnight temporarily with farmers. All snow-removal equipment works out of Decatur, taking advantage of the radiating system of roads center-

ing about the county seat.

The equipment owned by the county for the maintenance of roads, practically all construction being done by contract, includes the following:

- 1 Allis-Chalmers gas motor patrol with 12-foot blade
- 1 Caterpillar gas motor patrol with 12-foot blade
- 1 Adams Retrod Paver with D8 tractor
- 1 Caterpillar Fifty tractor
- 1 Caterpillar Thirty tractor
- 1 Caterpillar Sixty tractor
- 1 Caterpillar 2-ton tractor
- 8 1½-ton trucks
- 1 Adams 12-foot pulled grader
- 1 Huber 3-wheel 10-ton gasoline roller
- 1 Ferguson Model 151 maintenance roller
- 1 rubber-tired roller
- 1 Littleford Wheeled Roller
- 1 V-plow for Caterpillar Fifty tractor
- 1 V-plow for a 1½-ton truck
- 1 Rawls power mower
- 1 Case power mower
- 1 John Deere pulled mower
- 1 Hand-operated traffic-line marker
- 1 Littleford 200-gallon asphalt kettle
- 1 LaPlant-Chocate sheepfoot roller
- 1 Killefer tandem disc
- 1 underbody maintainer for a truck
- 1 Littleford 300-gallon Trail-O-Heater
- 1 Burch 10-foot force-feed spreader

*Which bonds will you have—U. S. War Bonds or the bonds of defeat, tyranny and slavery? Start now to invest 10 per cent of your income in War Bonds, for freedom.*

### Extending Life of Tires In Construction Field

How extra months of service can be obtained from the tires used on all types of excavating and construction equipment is explained in detail in a new booklet "Firestone Tires in the Construction Field," issued by the Firestone Tire & Rubber Co., Akron, Ohio.

One of the most important factors in securing the fullest possible life from tires is the maintenance of correct air pressure in tires used in off-the-highway operation of dump trucks, tractor wagons, scrapers, graders, and similar equipment. This Firestone booklet emphasizes that air pressures should be checked daily on a three-shift job and every other day on a one-shift job to make certain that the tires are neither over or under-inflated.

The condition of the roadway on which construction equipment travels has a vital bearing on whether or not the tires will deliver their full potential mileage. The increase in service which

tires will deliver under favorable operating conditions more than justifies the comparatively small cost of keeping roadways free of deep ruts, stones that spill from heaped loads, and other objects which might injure the tires.

These are only two of many pointers in the care of construction-equipment tires given in this Firestone booklet, copies of which may be secured direct from Firestone or from this magazine.

### UNIVERSAL! SPOT WELDERS ARC WELDERS

GASOLINE and  
DIESEL ENGINE DRIVEN  
ARC WELDERS

Prompt Deliveries

UNIVERSAL POWER CORP.

4296 Euclid Ave., Cleveland, O.



**THE** dusky youngster in the foreground is not alone in her astonishment. Hard, practical, straight-from-Missouri contractors and skeptical engineers have felt the same way after watching the SEAMAN PULVI-MIXER perform.

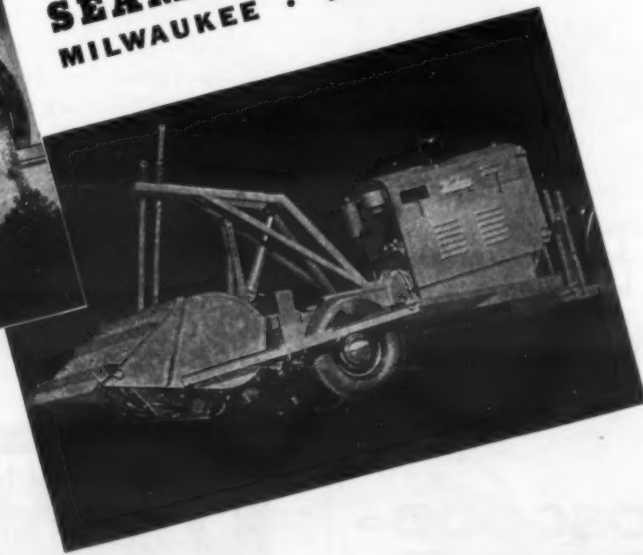
The startled youngster is watching the SEAMAN PULVI-MIXER at work on a soil-cement job. That's just one of the many stabilization processes which the SEAMAN PULVI-MIXER handles faster, better, more economically and more thoroughly than any other method. What kind of stabilization are you planning right now?—Soil cement? The SEAMAN PULVI-MIXER assures a successful operation through precision-control of cement and moisture proportions—evenly and thoroughly mixed through the full depth of the treatment ... One or another of the bituminous stabilizations? The SEAMAN PULVI-MIXER is the answer to every in-place mixing operation ... Calcium chloride? Fewer passes and a better, more thorough mix if you use a SEAMAN!

It's rotary action that does the trick. The rotor tines driven at great velocity literally create a tornado of the materials to be mixed. Study this cross-sectional view. It tells you more clearly than words why the SEAMAN PULVI-MIXER delivers an astonishingly thorough mix.

**SEAMAN MOTORS**  
MILWAUKEE • WISCONSIN



The SEAMAN PULVI-MIXER is manufactured in both tractor-operated and Motorized Models in mixing widths up to 75 inches.



### HEET-MASTER—SAVES 50% ON FUEL



HEATS TAR  
& ASPHALT  
TWICE  
AS FAST

Send for  
Bulletin No. 196

FREE

on  
Contractors

HEET-MASTER Kettles for  
AEROIL BURNER CO., INC.  
8775 Park Avenue, West New York, N. J.  
Chicago San Francisco Dallas



### New Heavy-Duty Oil For Engine Service

Shell Talpex, the new all-purpose detergent type of oil for gasoline and diesel engines, which was recently announced by the Shell Oil Co., is prepared from specially selected solvent-extracted base stocks and contains a combined detergent and oxidation-inhibitor type of additive. The producer states that this oil has passed the General Motors and Caterpillar rigid long-time high-load tests, as well as field tests in various types of diesel and gasoline engines throughout the country before it was put on the market.

The features of Talpex, as outlined by the producer, are: its oxidation stability, and minimum sludge, lacquer and deterioration products on pistons and rings, helping to keep the engine clean; its high detergency which keeps carbon and other foreign particles from adhering to pistons, rings, valve stems and other parts, thus preventing ring sticking and port clogging in diesels; its non-corrosive action on hard-alloy bearings; its low carbon formation; high film strength and good wetting ability, promoting long engine life and reducing scratching and scuffing of the pistons; and good startability and low-temperature operating characteristics.

Further information on Talpex and its use in either diesel or gasoline engines in trucks, power shovels, tractors, and other heavy-duty equipment in the construction field, may be secured direct

from the Shell Oil Co., 50 West 50th St., New York City, by referring to this item.

### New General Catalog on Maintenance Equipment

General Catalog No. 100, recently issued by American Steel Works, 1211 West 27th St., Kansas City, Mo., is devoted to its line of road maintenance equipment, pipe line equipment, steel tanks, and oil burners. This includes asphalt, tar and pitch heaters, maintenance distributors, combination tool heaters and melting kettles, surface heaters, tool boxes, sprayer trailer units, salamanders and water heaters and tamping rollers.

Each piece of equipment is clearly illustrated, construction features are described, and specifications are given. Copies of this general catalog, or literature on the equipment in which you are particularly interested, may be obtained by writing direct to the manufacturer and mentioning this item.

### Scrapers Speed Work On Minn. Grading Job

(Continued from page 8)

compacted by a Bros sheepfoot tamping roller. On really good going, John Dieseth reports that on other jobs he has regularly moved 1,600 cubic yards per scraper per operating day of 21 hours.

#### Stabilizing Fill Slopes

This job included many corrugated metal culverts, all of which were bituminous coated. The contractor elected to haul these from the plant at Minneapolis, Minn., rather than ship them by rail, as he found that his equipment trailer could handle the hauling more economically over the road.

As the fills were built up in the required layers, the specifications called for the toeing in of brush to stabilize the sides of the 3 to 1 slopes. The brush was laid in rows 5 feet apart. That this has not proved too successful was shown by the fact that some fills on which

brush had been placed washed out on this steep slope, leaving the outer ends of the brush unsupported.

#### Personnel

On this 2.87-mile grading project 0901-11 and 0901-12 of John Dieseth Co., Fergus Falls, Minn., B. K. Soby, a member of the firm, was Superintendent, with John Dieseth, principal owner of the outfit, on the operation a large part of the time. E. M. Gould was Resident Engineer for the Minnesota State Highway Department.

#### New District Sales Manager

Announcement has been made by the Columbia Chemical Division, Pittsburgh Plate Glass Co., Pittsburgh, Penna., of the appointment of K. C. Frazier as District Sales Manager of the New York Metropolitan area. For the past ten years, Mr. Frazier has been Southwestern Manager of the Southern Alkali Corp., an affiliate of the Pittsburgh Plate Glass Co.



**A** GAIN it's check-up time for snow removal equipment! When planning next winter's needs, remember these three important facts:

**First:** The necessity of keeping roads open for war production, troops and supplies.

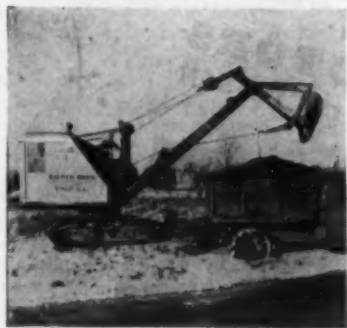
**Second:** The proven record of Walter Snow Fighters in opening highways faster and operating under the severest conditions.

**Third:** The importance of placing orders early, in view of war-time restrictions, to assure preparedness for the first blizzard.

Walter Snow Fighters are especially designed for snow removal. Their tremendous power, traction and ruggedness are provided by the exclusive Walter Four-Point Positive Drive, comprising the following engineering advances: Automatic Lock Differentials

which proportion the torque to each wheel according to its traction; Suspended Double Reduction Drive for larger gear capacity, higher ground clearance and less unsprung weight (maintaining better road contact and reducing wear on tires); tractor type transmission; and many other features. Write today for literature explaining these advantages of Walter Snow Fighters.

## OSGOOD



### TYPE 20

the biggest value in the 1/2 cu. yd. class. Available as shovel, crane, dragline, etc., on crawler, truck or pneumatic tired wheelmount.

Write for Catalog and Specification.

**THE OSGOOD CO.**  
MASON, OHIO

## WALTER MOTOR TRUCK CO.

1001-19 IRVING AVENUE, RIDGEWOOD, QUEENS, L. I., N. Y.



**Tire Conservation Dept.****Formed by B. F. Goodrich**

A Tire Conservation Department has been formed by the B. F. Goodrich Co., Akron, Ohio, to help conserve rubber and render tire consultant service to truck fleet operators, with John T. Staker as Manager. Contracts are negotiated with truck fleet operators and a service fee is based on the number of vehicle-miles run. Functions of the department are: to conserve rubber, as one of the contributions to the war effort; to make possible lower operating costs on tire equipment used by fleet accounts of the company; and to insure as nearly as possible continuous operation of fleet equipment, despite the rubber shortage or service interruptions

due to tire causes.

James E. Carhart, for many years a tire engineer in the truck and bus tire field, will be assistant to Mr. Staker.

**Gas-Tax Income Reduced Along Eastern Seaboard**

Gasoline tax collections for June, 1942 (the latest month for which figures are available), were 17 per cent less than in June, 1941, according to figures gathered by the Public Roads Administration. Reductions in the states in the gasoline-rationing area ranged from 22 per cent in Virginia and Georgia to 31 per cent in Rhode Island.

The collections indicate that a great many people no longer are using their

cars for non-essential purposes, since the use of gasoline to transport war workers to jobs and in freight transport for war industries has increased greatly over the same period. This conclusion is supported by a decrease of 21.6 per cent in vehicles counted at 514 stations on rural highways in 43 states in May, 1942, and compared with May, 1941.

**Welding Society Meeting**

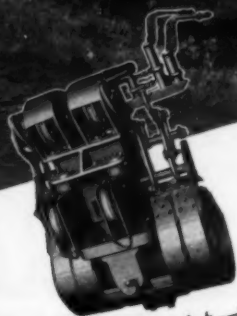
The 1942 Annual Meeting of the American Welding Society will be held at the Hotel Cleveland, Cleveland, Ohio, October 12-15. A number of interesting sessions have been planned, dealing with progress in the art of welding and its application to war production.

**New Pumpcrete Catalog**

Where and how to use Pumpcrete, the pump which pumps concrete, on your concreting jobs is described and illustrated in Bulletin No. 404 recently issued by the Chain Belt Co., 1666 W. Bruce St., Milwaukee, Wis. Information on the various sizes and models of Pumpcrete is given as well as how to figure pipe line for Pumpcrete jobs. The illustrations show Pumpcrete delivering concrete for warehouses and buildings, bridges and grade separation structures, tunnels, dams and locks, water and sewage treatment plants, caissons, breakwaters and jetties, and many other jobs.

Copies of Bulletin No. 404 may be secured by interested contractors and engineers direct from the manufacturer.

# Not a BALK in a BOWLFUL / with a Buckeye Hoist



NO SIR, you don't have any trouble pulling the loaded scraper bowl up out of the cut when you're using a Buckeye Hoist—no stalled engine—no need to kick out of the line goes into action with the master clutch. The line keeps right on rolling. Talk about ease of operation! The power just flows through a Buckeye. It's because of the planetary design and the brake and clutch action—no jerks, no slipping. The power is applied properly and its under split-second, fraction-of-an-inch control right at the operator's fingertips.

Built in medium heavy duty and heavy duty models for all tractors. Write for full details and check Buckeye Unitilt Dozers, too.

**BUCKEYE TRACTION DITCHER CO.**  
FINDLAY • OHIO

**CHECK THESE BUCKEYE HOIST FEATURES:**

- ✓ Planetary Design—superior for this type of service—longer-lived, easier to maintain.
- ✓ Large Drum Diameter—for longer cable life.
- ✓ Large Cable Capacity—spools enough to handle any tractor equipment.
- ✓ Large Braking Area—Buckeye brakes and clutches take hold smoothly and hang on.
- ✓ Cool Running—heat is rapidly dissipated—brake and clutch bands are in the open—long life is assured.
- ✓ High Leverage—permits easy control on the heaviest pulls with no slippage.
- ✓ Proper Sheave Design—keeps cables running smoother, longer.
- ✓ No Pull on Main Shaft—all transverse loads taken on bearings and housings.
- ✓ And many others.

## Built by Buckeye

Convertible Shovels



Trenchers



Tractor Equipment



R-S Finegraders



Road Wideners

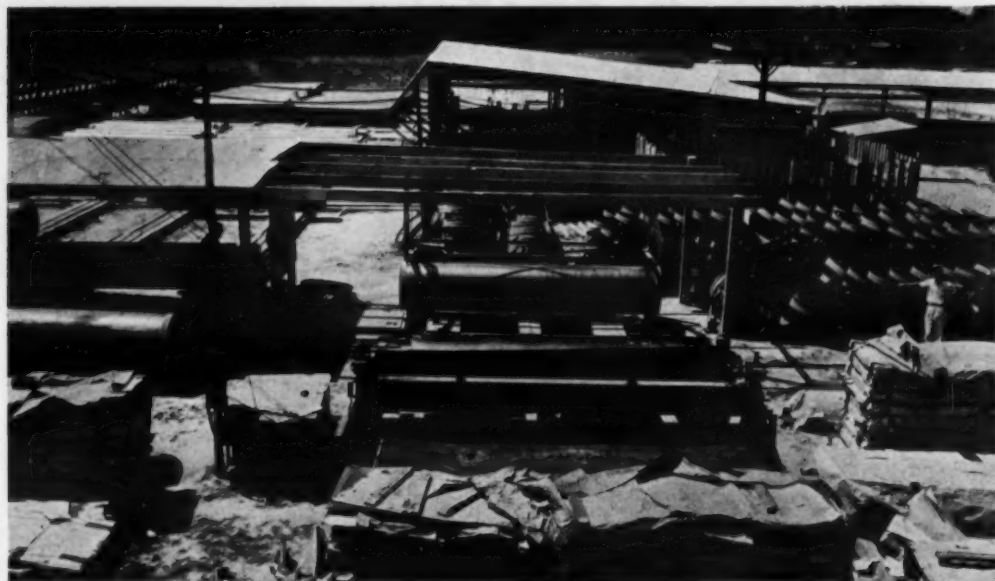


Spreaders

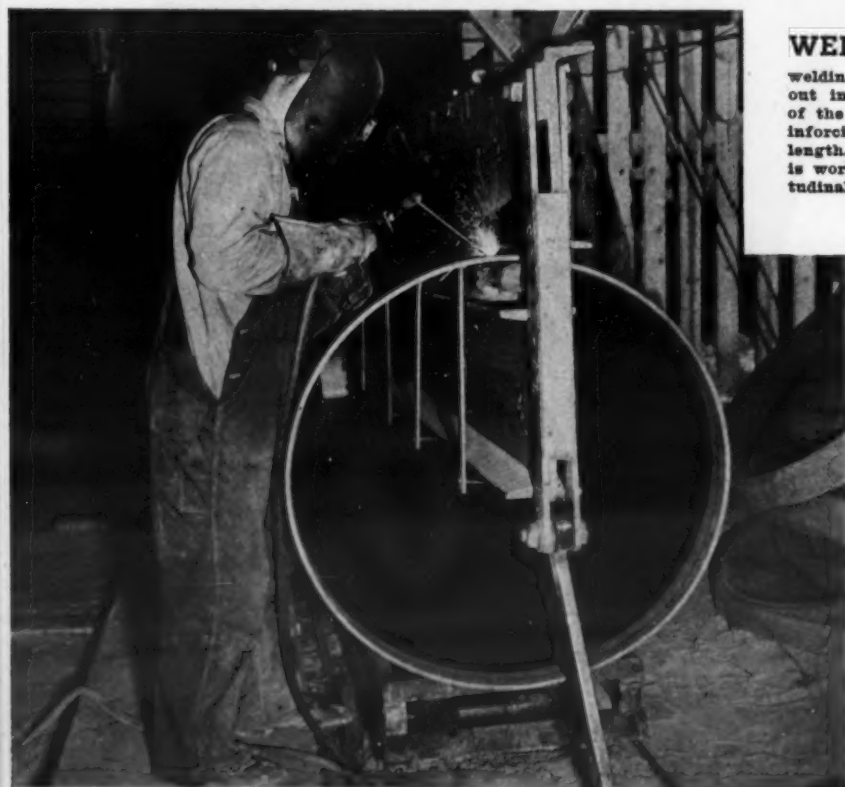




**THE START.** Flat sheets of steel are rolled to the proper curvature to form the integral steel cylinder for a 16-foot length of reinforced-concrete pressure pipe which the Lock Joint Pipe Co. is manufacturing at Ewell, Va., for the Chickahominy River pipe line. Each length of this high-pressure pipe is reinforced with a continuous steel cylinder which is rolled, assembled and welded right on the job. The pipe line will carry water from the Chickahominy River to Newport News and surrounding area.



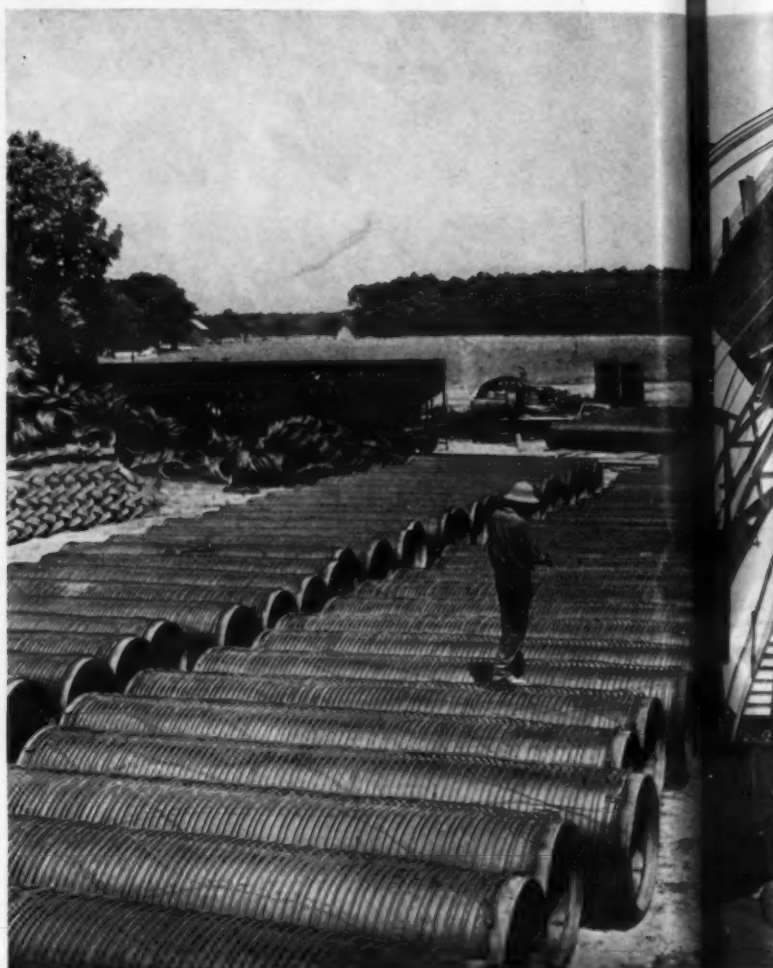
**THE YARD.** A portion of the Lock Joint Pipe Co.'s plant at Ewell. In the foreground are packages of steel sheets as received from the mill. These sheets are put through the curving rolls immediately behind them and assembled and welded into steel cylinders. At both ends of each cylinder specially shaped steel joint rings are placed, to provide the means of a water-tight connection between pipes.



**WELDING.** Electric welding is used throughout in the construction of the steel cylinder reinforcing for each pipe length. Here the welder is working on the longitudinal seams of a cylinder.

# New Concrete Pipes Serve Water Works

Temporary But Everlasting  
To Produce Pipes of  
Completes Section  
To 34-Inch in Two



**REINFORCING.** Scene at the plant where 35 and 34-inch reinforced concrete pipe is being produced for this 31-mile pipe line. Here the steel cylinders and reinforcing cages are ready to be placed in the forms for the concrete pouring.



**READY FOR CURING.** View of the concrete pipe ready for curing, just after the forms were stripped. All pipes are steam-cured before being placed in the storage yard where they are further cured by constant spraying. Pipe is produced at the rate of 1,000 feet per 24-hour day.



# Water Lines Program

at Ewell, Va.,  
Sections of 39  
Two Shifts

Foto-Farm



**BATCHING.** Aggregates and cement for the concrete are stored and batched in a C. S. Johnson 150-ton bin and batcher. All materials are carefully proportioned to obtain maximum density and strength of concrete and are mixed in a Ransome 2-cubic yard mixer.



**BACKFILLING.** After the backfill has been tamped up to the spring-line, the remaining backfill is placed by tractor and bulldozer on this 31-mile pipe line from the Chickahominy River in Virginia.

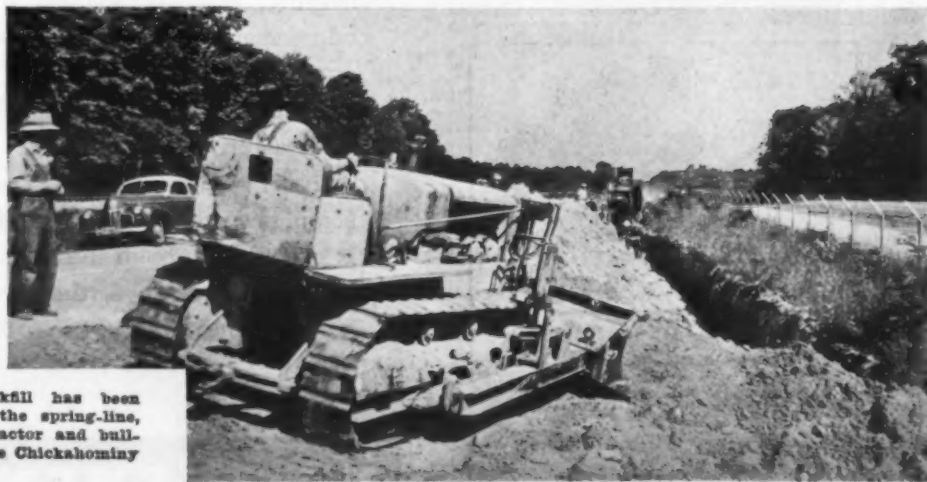


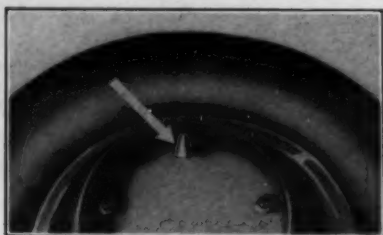
**EXCAVATING.** The Marion diesel-powered unit shown above serves the dual purpose of digging the trench and lowering the pipe lengths into place. Each section of pipe is 16 feet long and weighs approximately 4½ tons. After digging enough trench for one section of pipe, the machine lowers the pipe into the trench and the sections are joined together. The pipes are backfilled and carefully tamped by hand up to the spring-line.

Buy  
**EVERYBODY EVERY PAYDAY 10¢**  
U. S.  
**WAR BONDS**

## PIPE LAYING.

The same shovel, at the right, lowering a section of pipe into place. Digging and laying pipe with the same machine has resulted in rapid installation, with four crews laying as much as 1,617 feet per day of two shifts. This new pipe line will increase the water supply for war workers in the Hampton Roads area of Virginia.





The Lok-On-Nut to protect tires against theft.

### Protect Your Tires: Avoid Theft Worries

There are numerous jokes floating around about putting your tires in the safe at night or otherwise exercising the same care one would take of precious jewels. Actually, rubber is now one of the most precious materials in the world, and it behooves everyone to take special care of the tires he now has.

A simple, inexpensive and sure protection against tire theft has recently been developed by the Streeter-Amet Co., 4103 Ravenswood Ave., Chicago, Ill. Known as the Lok-On-Nut, it is a device without key, tumbler, pins and fragile parts, which only the man with the cap part can take off.

It is a tough hardened steel lock, not a die casting which can be broken by a hammer, and of a shape which will not permit any known tool to get a grip on the Lok-On part. It is installed by replacing one lug nut or bolt with the Lok-On, and can be removed only by the cap part which the tire owner or user keeps with him. For maximum protection, the Lok-On-Nut is designed in many different combinations.

Further information and prices on this Lok-On-Nut protection for your tires may be secured direct from the manufacturer by referring to this item.

### Freeze Hits Asphalt In Producing State

Texas is one of the largest producers, and users, of asphalt in the United States, so it has been hit two ways by the second of the asphalt freezing orders. Despite the availability of refined asphalt, and even crudes which have 85 per cent asphalt and can be used effectively without refining, Texas has had to curtail its use of asphalt. Refineries strategically located within the state could serve all of its needs with a minimum use of tank cars.

Approval of the use of asphalt on 7,300 miles of strategic network highways and 30 per cent of the state highway system, as well as on access roads not on the state highway system, between July 22, 1942, and January 1, 1943, has been secured. This permits both maintenance patching and betterment. Up to August 1, 1942, no access roads were being maintained by the state as they had not been completed and ready for maintenance.

Approximately all of the 250 state-owned asphalt storage tanks, averaging

10,000 gallons capacity each, were filled ready for maintenance operations when the freeze order was issued. This permitted the state forces under M. B. Hodges, Maintenance Engineer, to continue without interruption its program of protecting traffic in the constant battle of Pot-Hole vs Rubber Tire.

### Barnes New District Engr. For Portland Cement Assn.

Hugh D. Barnes, Regional Highway Engineer of the Portland Cement Association in the Pacific states for four years and Acting District Engineer in charge of the Los Angeles Office since September, 1941, has been appointed District Engineer. He will direct the work of the Association in southern California, Arizona and southeastern Nevada, with headquarters in Los Angeles.

For 15 years before joining the staff of the Portland Cement Association, Mr. Barnes was employed by the Kansas State Highway Commission in various capacities.

## Geerpres MOP WRINGER

reduces mop costs from 25 to 50 per cent over other methods of wringing—retains the mop fabric in a soft fluffy condition most desirable for rapid mopping. No more loose mop strings to catch around legs of desks and furniture when using GEERPRES.

New construction makes this wringer last for many years. Made in two sizes, small size will wring mops 14 to 24 ounces inclusive, large size 20 to 36 ounces. Available with or without tanks. Send for free circulars and prices.

**GEERPRES WRINGER, INC.**  
Manufacturers of High Grade Mopping Equipment  
**MUSKEGON, MICH.**



## Wanted urgently:

# STEEL SCRAP

Shortage of steel scrap is threatening the war-production program.

If ships, planes, tanks and guns are to be produced in the volume needed to win the war, the country's steel-making facilities must operate at full capacity. But the plain truth is that the steel scrap to support continued capacity operations is not available, and not in sight.

### United Effort Will Do the Job

Thanks to the construction of new blast furnaces, the deficiency is being partly made up by using more pig iron in steel-making. But tremendous quantities of additional scrap must be found within the crucial next few months.

Actually, many thousands of tons of steel scrap are potentially available *if only they can be gathered in*. This scrap, needed so urgently in the war effort, is scattered through the industrial plants, mines and railways, the farms and the homes of the nation. The problem is to col-

lect it and get it moving to the steel mills. Everyone must help. If everyone will, there will be scrap to meet the needs of the war-production program.

Make a checkup in your plant or warehouse, or any other property you own or manage, and in your home.

Have any odds and ends of steel or iron that may be lying around collected. If you have any obsolete or idle equipment, machinery, or parts—anything that's made of iron or steel and isn't really needed—junk it, and get the scrap moving toward the steel mills.

### How to Put Your Scrap to Work

Some iron or steel now lying rusting and forgotten around your property may help to save the lives of Americans in the battle areas. Gather up every possible bit of iron and steel scrap. Sell it to a local junk dealer, or get in touch with your local scrap salvage committee. Put your scrap to work for your country. It's needed, now!



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DISTRIBUTORS EVERYWHERE

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224 So. Michigan Ave., Chicago, Ill.

**BETHLEHEM STEEL COMPANY**







Spreading sodium chloride for ice prevention on a New Hampshire highway. Although most of the trucks use a tailgate, in this case the spreader is supported by a chain.

## New Hampshire Uses Salt for Ice Control

(Continued from page 12)

found that the patrolmen had not applied the sodium chloride immediately after plowing but had waited for some time until traffic had compacted the loose snow left on the roadway by the plows. It is much more difficult to secure the proper melting action when snow has been thoroughly packed by traffic to form ice than it is when the snow is still loose on the roadway. Furthermore there is liable to be a drop in temperature a few hours after a snow-storm has ceased so that damp snow compacted by traffic may freeze very solid, requiring a much higher concentration of the chloride for effective melting than is the case when the temperature is still close to 20 degrees F.

### Comparative Costs

LeRoy F. Johnson, Maintenance Engineer, New Hampshire State Highway Department, who is responsible for this development, in discussing this new and more effective way of securing snow-free and ice-free pavements with us, pointed out that sand costs about \$3.00 per cubic yard spread on the pavement and about 2 cubic yards were applied per mile. If not removed, compacted snow on the highway requires daily sanding until another storm comes or a thaw removes it. Compared with this, careful studies of the cost of the use of sodium chloride at the rate of 300 pounds per mile showed the cost to be \$3.00 per mile and only one application of the chloride was required, except for the most severe storms. An additional advantage is that the entire width of the pavement was maintained clear of snow and ice.

### Personnel

Frederic E. Everett is Commissioner of Highways, New Hampshire State Highway Department, and LeRoy F. Johnson is Maintenance Engineer. The total trunk-line and state-aid road systems in New Hampshire include 3,578 miles, 3,000 miles of which are maintained during the winter months. The photograph of the now obsolete sand storage bin and shed was taken up on State Route 4 between Dover and Concord, N.H., while the photograph of the unit used to apply the chloride was furnished through the courtesy of Mr. Johnson following our interview.

## Curtailed Blading Of Arkansas Roads

With its stock of grader blades rapidly dwindling to the vanishing point, the Arkansas State Highway Department has been forced to reduce the amount of blading on its large mileage

of gravel roads. M. C. Methvin, Maintenance Engineer of the Department, told us in an interview that the curtailment began early in April, 1942. There are 5,889.6 miles of gravel roads in the state which must be bladed to keep them in condition for the traffic they carry. On this system, a total of 53,880 blade-miles of maintenance was carried on per month prior to last April. Now this has been reduced to 38,273 blade-miles a month, a reduction of 28.97 per cent.

The reduction was no hit-or-miss proposition but was based on the 1939 Highway Planning Survey traffic counts, adjusted in some localities where there is now extra heavy traffic due to war construction which was non-existent at that time. A complete tabulation of the blade-miles operated in each patrol section, the usual number of bladings per month, and the 1939 and, where needed, the adjusted traffic counts showed where savings could be made and, in some cases, where increased bladings were advisable. With eight bladings a month formerly the rule, the number in some

instances has been reduced to six or even four. Other sections, where there had been only two bladings a month, have had the number increased to four because of temporary construction traffic.

### Booklet on Rubber Care

A 24-page pocket manual on the care of industrial rubber products has been issued by the New York Belting & Packing Co., 1 Market St., Passaic, N. J., as part of its contribution to the efficiency of the war production drive. Realizing that the war may be won by the effective use and conservation of belt, hose, and packing already in existence, the company has brought together into one useful volume valuable data on products care of the type often overlooked by busy maintenance men.

Copies of the manual, entitled "How To Get Longer Life From Mechanical Rubber Goods," may be obtained direct from the manufacturer by mentioning this item.

## CHICAGO PNEUMATIC NEWS

# CP CONTRACTORS' TOOLS SPEED WAR WORK



↑ **FIRMER, MORE UNIFORM** tamping comes from use of CP Backfill Tampers. In trench work, particularly, they quickly earn their cost by savings in the time and labor of hauling away surplus excavated materials. Four models available to meet every tamping condition encountered. Easy control of speed and impact is an important feature of all CP Tampers. Write for Catalog No. 600.

## DEMOLITION TOOLS, CLAY DIGGERS, TAMPERS—ALL BIG TIME-SAVERS

### CP Wrenches Favored for Speed and Safety

CHICAGO (CP)—On many projects, time-saving pneumatic CP contractors' tools are speeding vital work. On tamping jobs of all kinds, CP Backfill Tampers are saving the time and labor of hauling surplus excavated materials. In clay, shale or other similar digging, one CP Clay Digger keeps several hand shovelers busy removing the spoil. In tearing out concrete and brick foundations and walls, cutting and breaking pavements, trenching, etc., CP Demolition Tools are great time and money savers. Where nuts have to be applied or removed, CP Pneumatic Wrenches (impact type) are far faster, and—having no torque—far safer.

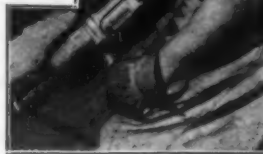
## CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 E. 44th St., New York, N. Y.



ON OR OFF "In the wink of an eye," describes briefly, but accurately, the time-saving application or removal of nuts, bolts, lag screws, etc., with CP Pneumatic Wrenches (impact type). Bulletin 812 gives detailed data.

← **CLAY, SHALE, ETC.,** are removed quickly and at low cost through use of CP Pneumatic Clay Diggers. No. 3, for general digging in soft and medium clay; No. 5, for hard clay, shale, etc. Write today for Catalog No. 564.



FOR DEMOLITION work of all kinds, contractors find CP Demolition Tools indispensable time and cost cutters. Adaptable for tamping, trenching, back filling, driving sheet piling, spikes. Bulletin 855 gives complete data.



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## CHICAGO



PNEUMATIC

## CONTRACTORS' EQUIPMENT

Air Compressors, Rock Drills, Pneumatic Tools, Vibrators, Pumps, Electric Tools, Diesel Engines



## Handling Concrete For New Flood Wall

(Continued from page 15)

cured a small vacant lot near the west end of the project for use as a yard, adjacent to a tall brick icehouse which had been abandoned. In this yard he set a raised frame and on this built the frame work of studs for the 20-foot form panels for the wall and then screwed the  $\frac{3}{8}$ -inch plywood to this frame. This method made it easy to remove the plywood if it were damaged, without wrecking the supporting frame work. The studs were 2 x 6 lumber on 16-inch centers with 2 x 6 block spacers at four points from top to bottom, dividing the form equally. Double 2 x 6 sills were used top and bottom of each form and double 2 x 6 studs were placed at the ends of the form for strength. A total of 7 wales of double 2 x 6's were used horizontally as backing for the studs and held apart by small 1 x 2 blocks to provide space for the  $\frac{3}{4}$ -inch screw rods of the Universal form ties. Inside  $\frac{3}{8}$ -inch rods were used, screwed into the cones. For handling these panels with the minimum chance of damage, the contractor inserted two 1-inch rods in each panel vertically. At the bottom an iron plate was countersunk between the two 2 x 6 timbers making up the sill and the bottom 2 x 6 was cut out to countersink the nut on the bottom of the rod. At the top a similar plate was inserted at the top of the upper 2 x 6 to take up the wear on the lumber when handling the forms with a crane.

To brace the forms the contractor set bolts in the footing at 6-foot intervals and about 1 foot from the outer end of the footing. These were used to attach turnbuckles and cable which was carried to the top of the forms and tightened or slacked as required to hold the form in exactly the right position by instrument. This method was used even though the angle of the brace was rather acute, because it gave a uniform method of handling the bracing from end to end of the job. There were few places where there was sufficient space to bury deadmen for braces because the first part of the wall was built in very tight quarters in an alley between buildings and the major portion of it ran along a roadway adjacent to the river bank.

The contractor built five sets of 40-foot forms in 20-foot panels because the forms were required to be left in place at least 48 hours after pouring, and it was the desire of the contractor to pour one monolith of wall per day and some days two monoliths and it required about one day to strip, move and set up a panel complete ready for pouring.

### Handling the Concrete

Concrete was purchased locally from a commercial producer and was delivered in truck mixers. For the key wall and footing the concrete was chuted in most cases direct to the forms, but the concrete for the wall was emptied into a 1 $\frac{1}{4}$ -yard Insley concrete bucket from the truck mixer and then raised by a Northwest crane with a 45-foot boom to the top of the forms where it was

discharged through the narrow neck of the bucket into metal hoppers and elephant-trunk chutes. All concrete as delivered to the forms on this job was vibrated with four Master mechanical vibrators.

In order to take care of the men required at the top of the wall stem form, the contractor built a heavy scaffold with 4 x 4 posts and 1 x 6 braces and sway braces both ways. The top deck was composed of 2 x 8 planks.

### In Tight Quarters

The south end of the wall ran between some buildings facing on the main street of Portsmouth, then turned a right angle past the icehouse as far as the next cross street, and then made another right-angled turn to Front Street along the old city wall. These tight quarters left little space to swing the Northwest crane but it was run in on alternate sides of the wall as soon as the toe drain was completed and the compacted backfill placed. At one section, in pouring a 40-foot monolith, five hoppers were set

as usual and it was possible to pour the first two direct from the Insley bucket but the other three were poured by discharging the concrete from the Insley

bucket into CMC rubber-tired concrete buggies and wheeling the concrete about two thirds of the length of the form.

(Concluded on next page)

## GRIFFIN JETTING PUMPS

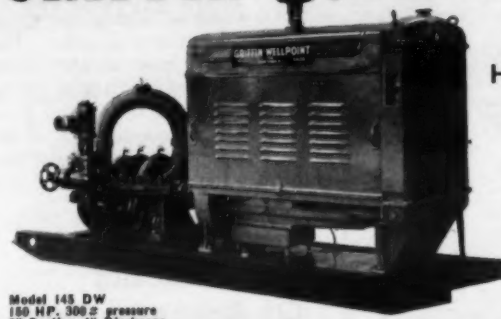
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marines, mine sweepers, sub chasers and ocean-going tugs!

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RPM DELO will give your Diesels the same dependable protection the Navy demands. No other oil combines its anti-oxidant, cleaning and non-corrosive properties. It eliminates ring-sticking and sludge trouble, lengthens the time between overhauls. Switch now to RPM DELO, proved under the severest tests to be the world's finest Diesel lubricating oil.

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Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity

## TARPAULINS ROAD MATS WINDBREAKS

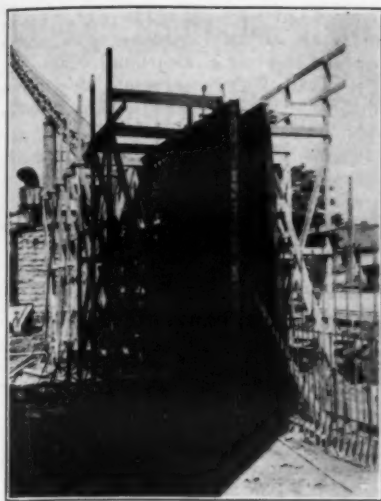
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C. & E. M. Photo  
Forms for the new concrete flood wall at Portsmouth, Ohio, set up in close quarters in an alley.

## Flood Wall Built In Tight Quarters

(Continued from preceding page)

A Koehring diesel 1-yard shovel was used to excavate a basement in one section of the alley where the wall made a right-angled turn. One of the few rain storms which occurred during the summer of 1941 came on the day that the shovel was getting to the bottom of the excavation which delayed the work materially because the clay was practically impossible to work for several days.

### Quantities Involved

The total length of the new concrete flood wall, including the eight movable gate closures across streets and railroads, is approximately 4,000 feet. The quantities involved in this contract for this wall were as follows:

Structure excavation.....	42,850 cu. yds.
Compacted backfill.....	21,900 cu. yds.
Uncompacted backfill.....	6,750 cu. yds.
Pipe, sand and coarse aggregate drains.....	4,300 ft.
Concrete.....	19,950 cu. yds.
Reinforcing steel.....	2,518,000 lbs.
Reinforced-concrete pipe, 18-inch.....	335 ft.
Reinforced-concrete pipe, 42-inch.....	12 ft.
Reinforced-concrete pipe, 48-inch.....	50 ft.
Drain, 6-inch diameter.....	120 ft.
Corrugated metal pipe, 18-inch.....	21 ft.
Cast-iron pipe, 24-inch.....	36 ft.
Vitrified-clay pipe, 15-inch.....	11 ft.
Vitrified-clay pipe, 24-inch.....	145 ft.
Vitrified-clay pipe, 30-inch.....	20 ft.
Sluice gates and appurtenant parts.....	6
Movable gate closures.....	8
Miscellaneous metal.....	35,000 lbs.

Five of the eight movable gate closures consist of structural steel trusses for supporting the steel purlins which take the load of the waterproof creosoted wood facing spanning the street and railway openings in the wall. The three remaining closures are small enough to require only horizontal purlins between abutments to support the wood facing. The miscellaneous metal is that which is imbedded in the concrete to furnish bearing for these steel trusses when erected in the roadways and between railway tracks.

The payment for the removal of the old concrete wall built by the city was by cubic yard measured on removal as there was no adequate record of the volume of concrete involved in the old structure.

### Personnel

This contract for the construction of the Portsmouth concrete flood wall was started May 15, 1941, and the contractor allowed 275 calendar days to complete the work. The contract was awarded to Charles D. Smith of Fond du Lac, Wis., for whom H. W. Kleinfeld was Superintendent and Martin Christenson, Assistant Superintendent. The work was done under the jurisdiction of the Cincinnati Office, U.S. Engineer Dept., Lieut.-Col. Fred. T. Bass, District Engineer, with Kenneth S. Brown as Resident Engineer at Portsmouth, Ohio.

## New Type of Closing Extends Life of Bags

The Office of Agricultural Defense Relations is urging all users of cotton and burlap bags to conserve their bags carefully. To cooperate with this conservation program, a new type of bag closing, known as the Bemis Rip-Cord Closure, has been developed by the Bemis Bro. Bag Co., 501 So. Fourth St., St. Louis, Mo.

This Rip-Cord is sewn into the closure of the bag by a two-thread bag-closing machine. A quick jerk of the Rip-Cord opens the bag instantly, saving time and also without tearing or damaging the bag in any way. It is stated that bags so closed are more compact, taking up less space in freight cars, trucks or warehouses, which is important in these days when space is at a premium. By pulling the Rip-Cord part way across the bag, a useful pouring spout is provided where only a part of the contents of the bag is to be removed at one time. The manufacturer states that many extra trips can

be secured from cotton or burlap bags having the Rip-Cord Closure.

A 4-page folder, describing and illustrating the Bemis Rip-Cord Closure and the savings in time, labor and materials resulting therefrom, may be secured by those interested direct from the manufacturer by referring to this item.

## Vibration-Proof Nuts Described in Wall Chart

A wall chart explaining the uses of its various types of self-locking nuts is being distributed by Elastic Stop Nut Corp., Union, N. J. The center of the chart is devoted to an illustrated description of the basic principle by which a self-locking action is obtained, followed by cross-section drawings showing the method of application of the nine types of Elastic Stop Nuts most generally used, with photographs of these types.

Copies of this chart may be obtained gratis by writing direct to the manufacturer and mentioning CONTRACTORS AND ENGINEERS MONTHLY.

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*means quicker Victory!*

"Simplified" means greater efficiency through longer hours of valuable service. Operators get peak performance, since their entire shift with less fatigue. **Remote Control** gives correct "heat" regardless of distance work is from machine. Insures the right weld quality with no waste time. Many other Hobart speed-features. Investigate today to speed wartime construction.

Just \$2 brings you this NEW 1942 WELDING BOOK on HOW you can GET MORE out of your ARC WELDERS. Explains latest techniques, methods, equipment and materials. Complete book that'll pay you dividends. Order today. HOBART BROS., INC. 32, Troy, O.

# 27.5 % increased yardage with WELDED DIPPER



**T**HIS 15½-yd. PMCO welded dipper replaced a 12-yd. solid cast dipper of practically same total loaded dipper weight, and added 27.5% to daily output of shovel in a well known middle west coal mine. The yardage per hour, with the solid cast dipper, of 486 yds. was increased to 620 yds. with this PMCO welded dipped without additional power or structural change in the shovel.

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The new Smith-Mobile self-aligning feed chute.

### Self-Aligning Chute To Feed Truck Mixers

A new combination feed chute and closing-door support which is self-aligning is a feature of the latest models of Smith-Mobile truck mixers and agitators, made by the T. L. Smith Co., 2857 No. 32nd St., Milwaukee, Wis. This new chute eliminates the need for manual adjustments and assures smoother operation, the manufacturer states.

A uniform contact between the revolving sealing ring and the mixer drum is established throughout the entire 360-degree surface, thereby compensating for whatever misalignment results from the weave of the truck chassis. In addition, the new design provides a self-cleaning feature, as grout which might work past the seal can not possibly get into the bearing surface in which the sealing ring rotates.

Further details on this and other features of the Smith-Mobile may be secured by those interested direct from the manufacturer or from this magazine.

### Highway Capacities, Theoretical and Real

In 1939 the Public Roads Administration published the preliminary report of its highway-capacity studies which had been carried on in cooperation with the highway planning survey organizations in several states. These early studies have been used extensively in the solution of traffic control and highway-design problems. Data obtained prior to 1939 have been supplemented by more extensive recent data, and analyses have been completed to determine the theoretical, possible and practical capacities for 2, 3, and 4-lane highways.

The maximum theoretical capacity of a single traffic lane is about 2,000 vehicles per hour, occurs at speeds above 30 miles per hour, and can be attained on 4-lane highways or on short sections of 2-lane roads.

The total possible capacity of a long section of 2-lane highway with good alignment, carrying few trucks, is about 2,000 vehicles per hour or one-half its theoretical capacity. A corresponding value for 3-lane 2-directional highways is 3,600 vehicles per hour. The maximum possible capacity of a 4-lane highway is 8,000 vehicles per hour or 4,000 vehicles per hour for the two lanes used by traffic traveling in one direction. When trucks constitute 17 per cent of the traffic, the possible capacity of a 2-lane highway is reduced by about 25 per cent.

The practical working capacity of a

highway is a relative value and depends upon local conditions as well as the width or number of lanes. The maximum practical working capacities for 2, 3, and 4-lane rural highways under normal conditions are 800, 1,400, and 2,800 vehicles per hour, respectively.

The results presented in the present study published in the June, 1942, issue of *Public Roads* are of sufficient scope to be of value in the determination of the practical capacity of any highway condition and in the solution of numerous traffic control and design problems. Since the results are based on data gathered prior to the present tire and gasoline rationing programs, they will be of maximum value upon a return to normal driving conditions. However, many of the problems developed are applicable to military traffic as well as the efficient movement of civilian traffic in the neighborhood of defense industries.

Invest at least 10 per cent of your income in U. S. War Bonds.

### Colloidal Graphite For Use in Lubricants

A new folder recently issued by Nassau Laboratories, Hackensack, N.J., describes natural colloidal graphite and its uses in lubricants. This company's product, Cograph, made in several grades, is a natural graphite of great fineness for suspension in the thinnest lubricants and liquid fuels. The micro-

scopic particles form a skin over bearing and shaft surfaces, reducing wear, overheating, and rust and carbon formations, it is stated. It does not supplant present lubricants; it supplements them, to provide increases in efficiency.

Copies of the bulletin containing complete information on natural colloidal graphite may be obtained direct from Nassau Laboratories by mentioning this item.

### ANTICIPATE Your Repair Needs AHEAD OF TIME for DAVENPORT-FRINK SNO-PLOWS



"Business as usual" is out. Prompt shipment of repair parts is impossible. We urge you to check over your repair needs NOW and send your orders in PRONTO. We'll do our level best for you. Priorities are required and higher priorities are demanded on some parts than on others. Prompt action on your part may avoid the cost and inconvenience of snow-blocked roads. Delay may prove disappointing and costly.

**DAVENPORT BESLER CORPORATION** Dept. A  
DAVENPORT, IOWA  
Made in Eastern U.S.A. by CARL H. FRINK, 1000 Islands, CLAYTON, NEW YORK



This illustration is taken from a Barrett Tarvia advertisement in *The Saturday Evening Post* which emphasizes the vital importance of the war-time maintenance programs of America's highway engineers and contractors.

### FEEDER ROADS ARE FIGHTER ROADS AS WELL

One of America's most valuable weapons of war is the all-weather highway that links farm to market and village to city, across the length and breadth of our land.

Today, these roads are doing double duty in the cause of victory. For over them, night and day, travels an endless stream of farm trucks from the arsenal of food—and over them, too, move fighting men and fighting materials to a thousand strategic centers of war. They are a vital part of America's 75,000 mile

"Strategic Network" of military access and tactical roads.

It is especially important that these roads be maintained in first class condition for the duration. It's a responsibility of every highway engineer and contractor—a huge problem of maintenance on which Tarvia and the Tarvia field man can help you.

For nearly 40 years Tarvia has been helping highway engineers get the most out of available highway funds. This universal tar paving

material is being used with outstanding success to extend the life and service of all types of highways. It has proved the sound economy of "stitch-in-time" road work that saves heavy replacement costs.

Why not discuss your road problems with the Tarvia field man? You'll find him ready with helpful cooperation, based upon Barrett's unmatched experience with road construction, repair and maintenance. Phone, wire or write our nearest office.



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## Navy's "Seabees" Call For Construction Crews

Men Skilled in Equipment Operation And Construction Trades Needed to Build Advance and Mobile Bases for Our Forces

(Photo on page 52)

FOR all bonafide construction workers who desire to get into action for Uncle Sam, there is a place awaiting them in the "Seabee" regiments, a newly formed branch of the U. S. Navy, units of which are already found at advance and mobile bases at many points outside the continental limits of the United States.

The "Seabees", in following up Uncle Sam's sailors and marines, constitute one of the most important and necessary branches of the United States Navy. They will be right behind those fighting men with their task construction and fuel depots and their new runways which will be of distinct advantage in forming the stepping stones for attacks upon the enemy.

Primarily, they are a closely knit body of men under command of officers of the Navy's Civil Engineer Corps, carrying out effectively all phases of construction work in potential combat zones, with the necessary military training to resist effectively any enemy interference with their assigned task.

This new branch of the Naval Service is expanding very rapidly and will continue to do so for months to come. It began in October, 1941, with one company of 99 men, including automotive repairmen, drillers, blacksmiths, electricians, firemen and a dozen or so other trades. Two months later five additional companies were formed, designated primarily for utilization as administrative units by Officers-in-Charge of construction where work was being done by contractors with civilian labor. Their usefulness was soon made manifest.

Last December, one construction regiment of approximately 3,300 officers and men was authorized, and recruiting was under way in January, 1942. The first battalion of the first regiment started its training on January 26, and one group was sent to the Naval Air Station at Quonset Point, R. I.

### Type of Men Needed

The Navy desires that volunteers for the "Seabees" be skilled in their trades, and openings now exist for experienced construction equipment operators, draftsmen, welders, steel workers, carpenters, riggers, dock workers, and similarly trained men. Eventually, the "Seabee" program will require over 100,000 enlisted men in its construction battalions, which will be recruited and trained in approximately 1,000-man units.

All applications for enlistments are first approved with regard to the technical qualifications of the applicant at one of the five recruiting districts. Professional qualifications correspond to the trade of individual applicants. Qualified men are enrolled in Class V-6 of the Naval Reserve with ratings from Sea-



Official U. S. Navy Photo  
Navy "Seabees" erecting a 10,000-barrel water supply tank at a Naval Base somewhere in the South Pacific.

man, second class, to Chief Petty Officer, with normal base pay, allowances, and chances for promotion.

From recruiting centers, "Seabees" are sent to Naval training stations throughout the country for thorough

training and indoctrination before being assigned to distant bases. A training station to accommodate 10,000 men is now being erected at Norfolk, Va.

Organized along military lines, companies of "Seabees" form regiments of three battalions, each battalion comprising four construction companies of 226 men each and one headquarters company of 165 men, composed mainly of specialists such as clerks, cooks, bakers, surveyors, etc.

### A Chance for Service

The mission of these construction units is clearly outlined by Rear Admiral Ben Moreell, Chief of the Bureau of Yards and Docks, who says: "This is a real opportunity for those two-fisted red-blooded Americans who are not fighting behind a gun to serve shoulder to shoulder with the combatant forces of Naval Service."

Those interested should apply direct to the nearest Navy recruiting station.

Buy U. S. War Bonds.



## in the Performance of a Balloon Winch Truck!

● The military takes no chances on truck performance for its barrage balloon service. Trucks must be able to go anywhere they are needed regardless of the terrain to be traveled. Neither the steepness of grades nor the depth of sand, mud or snow can be permitted to stop them.

That is one reason why Marmon-Herrington All-Wheel-Drive converted Fords are so widely used for this exacting service. These vehicles have proved their "get there" ability in Texas and Louisiana oil fields, in logging camps of the great Northwest, in road building and road maintenance work from coast to coast, as well as in the jungles of the tropics, and the sands of African deserts.

Tens of thousands of the same units are providing fast, dependable transportation of men and materiel for the United Nations on all fronts.

The Marmon-Herrington principle of converting standard mass-production vehicles to All-Wheel-Drive has given America and our Allies numerical as well as operational superiority of vehicular transport over all our enemies in less than two years' time. The same principle will give American industrial and civilian users the tremendous advantage of All-Wheel-Drive propulsion at truly economical cost in the days of reconstruction following the certain victory of our arms abroad.

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## A Hot-Mix Road Job In Northern Ontario

### McNamara Constr. Co. Used Two Plant Set-Ups to Pave 60 Miles of Highway Vital To Canadian War Industry

IN the past two years, under several contracts, the McNamara Construction Co. of Toronto, Ontario, has graded and paved over 60 miles of Ontario Highway 11, extending from North Bay to beyond the junction of Highway 66 leading to the gold-mining town of Kirkland Lake. This is a section of the great northern trans-continental artery, the Ontario section of which is being completed through the construction of the link between Hearst and Geraldton.

The work was done with three asphalt plants and two stone crushing and screening plants in various combinations from an initial set-up at Englehart, and a second near the northern end of the projects at Dane. The second location and operation is described below.

#### Aggregate Supply

A 165-acre sand and gravel pit located adjacent to the plant supplied all of the aggregate at the Dane set-up of two of the plants. Two Northwest 1 1/4-yard shovels loaded to three or four shuttle trucks, which hauled the pit-run material to a Pioneer portable crushing and screening plant. This plant took out the size of stone required for the longitudinal drains at the edge of the pavement, and stockpiled the balance for the use of the hot-mix asphalt plants. Either one or two trucks hauled the material from the Pioneer plant for the asphalt plants when they were running.

#### Asphalt Supply

As there was no siding close to the location of the asphalt plants, it was necessary to haul the asphalt 7 1/2 miles by two 750-Imperial-gallon tank trucks equipped with heaters. In Ontario, asphalt is furnished by the Department of Highways but must be hauled from the siding by the contractor. A 25-hp vertical steam boiler, operated at 100 to 110-pounds pressure, fed steam to a line laid along the siding with connections for seven tank cars.

The tank trucks were loaded by gravity from the cars, hauled the asphalt to the plant, and then ran up a ramp above the asphalt storage tanks. Here a 1-inch steam line was located with a flexible hose to supply steam at 110-pounds pressure to the trucks, to permit the asphalt to flow freely by gravity into the tanks. Two storage tanks, one 8 feet in diameter and one 6 feet in diameter and each 32 feet long, were provided for the storage of 40 and 32 tons of asphalt respectively. In addition, a 12,000-Imperial-gallon fuel-oil tank was located at the plant.

For handling the asphalt from the tanks to the weigh buckets of the two asphalt plants, two Kinney steam-jacketed and steam-driven asphalt pumps were installed. One was sufficient

to handle all of the asphalt required for the two plants, the second being held in reserve. The asphalt was delivered through a single steam-jacketed line to the two weigh buckets, with no return.

#### The Two Mixing Plants

The mixed aggregates for the hot-mix paving were delivered from the Pioneer plant by the truck backing up a ramp and dumping into a hopper, from which the material flowed through two holes to the feeds of the two separate cold elevators, one going to each of the two plants. This installation was comprised of a 30-ton-per-hour assembled plant and a 60-ton-per-hour Cumber plant, with a combined capacity under optimum operating conditions of 1,485 tons in a 14-hour run.

The 30-ton plant has a drier which was originally built as an auxiliary drier for pre-drying very wet material from a stockpile. It is 42 inches in diameter and 18 feet long, and is heated by an oil torch using Bunker C fuel oil preheated in the tank. The discharge from the

drier is carried by the hot elevator to a revolving screen at the top of the plant, which screens out the 1/4-inch material and wastes all material over 1 1/2-inch which is used for tile drain when required or else is fed back to the Pioneer plant for re-crushing. This plant has a 10-ton hot bin for the storage of aggregate.

The asphalt used in this work was 160 to 180-penetration asphalt, and with this the mix was run at a temperature of 200 degrees while from 220 to 225 degrees was needed for good work on the spreaders. The steam from the asphalt storage tanks was run through coils in the fuel-oil tanks at a temperature of about 90 to 110 degrees to maintain the Bunker C oil in a sufficiently fluid condition for easy atomization.

Two men work on the operating platform of the smaller asphalt plant, and the same number on the larger. One handles the batching of the aggregate and the other the asphalt, and either one dumps the batch into the pugmill. The

(Concluded on next page)



*Certainly* WE HAVE THEM, IN STOCK, WAITING FOR YOU

For every Cleveland we have made on a production basis in the past twenty years, the spare parts are on hand, ready to go forward no later than the next day after receipt of your order. They are guaranteed to fit, too, and they are all made in the well-known Cleveland quality—they stand the gaff! When ordering, to obviate delays, be sure to give us the Model and Serial Numbers. ★ In these times, when all of us are doing our strenuous best to speed up the building of roads, dams, airports and army bases, the machines so necessary to this program must be kept in their best possible working condition. Against the time when you may need spare parts, be sure you have a Parts List on hand. Write or phone us the Model and Serial numbers of your rock drills, paving breakers, diggers,

tampers, and wagon drills, and the correct Parts List will be sent by return mail. ★ Did you get your copy of the Driller's Handbook? It tells you many ways of getting more work out of your air tools, how to keep them busy on the job, and delivering as they should deliver for this important war-time work.

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will assure clean highways with more speed and less expense. "They always come in from a finished job ready to go out on another."

All our effort and plant facilities are directed to the production of equipment for defense. We MUST and WILL win this war. We can ALL help. Buy war bonds and stamps, buy them today.

**The BURCH CORPORATION**  
Crestline, Ohio



## Hot-Mix Surfacing On Ontario Highway

(Continued from preceding page)

specified time for wet mix of aggregates and asphalt was 45 seconds on the base and from 60 to 70 seconds for the top mixture. The smaller plant handles a batch of 800 to 1,000 pounds, while the Cummer plant handles a batch of 2,300 to 2,500 pounds. Both plants are equipped with steam pistons for dumping the batches into the waiting truck. A mist of fuel oil is sprayed in the bodies of the trucks about every third load to keep the asphalt from sticking, and a similar spray is used on the screed of the spreaders on the road.

The 60-ton Cummer asphalt plant has a 60-inch diameter x 16-foot long oil-fired drier and revolving screens similar to those used on the smaller plant. A 15-ton storage bin is provided for hot stone.

### Spreading the Mix

The contractor used two Jaeger Bituminous Pavers in echelon with one paver about 100 feet in advance of the second. By working in this manner, the heat at the center joint was saved, traffic could work through between the two machines where necessary, and work progressed uniformly with an almost invisible joint. The hoppers of the bituminous pavers are 9 feet wide, so that the truck dumps clean into the hoppers and does not require shovel men at the front. This reduces the paving crew to the machine operator, the foreman who watches the two wings, and two rakers.

Due to the very soft asphalt used in this mix and the coarseness of the aggregate, honeycomb occurred frequently in the base material. For this reason, from two to four laborers hand-cast fines shoveled from the hopper over the honeycomb so that it could be raked in. The reason for this difficulty was the range of sizes in the aggregate, from 1½-inch down to sand, and, with the high temperature of the mix and the high penetration asphalt, there was considerable segregation during the hauling of the batches to the bituminous pavers.

### The Roller Fleet

It is part of the ritual of rolling on a McNamara job to keep the first 8-ton Galion gas 3-wheel breakdown roller from 8 to 10 inches away from the center joint when rolling the advance strip. This is done so that when the second bituminous paver lays its strip the breakdown roller will straddle the joint and iron it out. The breakdown roller makes two or three passes, and sometimes it is necessary for it to wait a considerable length of time so that the mix will lose some heat and will not shove in front of the rolls. The asphalt is not tacky below 150 degrees Fahrenheit.

The next two rollers are 10-ton Galion gas 3-wheel rollers, followed by two 13-ton Sawyer-Massey steam rollers. Occasionally it is necessary to use another 13-ton Sawyer-Massey steam roller one day later, and in very hot weather this roller works two or three days behind the actual laying of the mix. All of the rollers have 24-inch rear wheels.

On this work, paving a 20-foot width, 700 tons of asphalt mix were required per mile 1 inch thick. The contractor regularly maintained a production of 0.75 mile in a 13-hour working-day. The working-day was extended to this length because of the shortness of the construction season in northern Ontario; and also, fortunately, the sun sheds its light on the work later in the evening.

### Personnel

The work described in this article was done under the direction of Victor Longstaffe, Division Engineer, Division 14,

East Cochrane and New Liskeard District of the Ontario Department of Highways, of which A. A. Smith is Chief Engineer. For the McNamara Construction Co., Ltd., of Toronto, Ontario, the work was in charge of George Greig, as Superintendent and Engineer.

### New Managing Director, National Safety Council

Ned H. Dearborn of New York City was recently named Executive Vice-President and Managing Director of the National Safety Council, succeeding W. H. Cameron who is retiring after almost 30 years in that position.

Mr. Dearborn, who has been Dean of the Division of General Education of New York University since 1934, has had wide administrative experience and has been actively engaged in accident prevention for several years. In his new position he will direct the greatly expanded wartime program now being conducted by the Council as a result of a proclamation by President Roosevelt.



WRITE FOR CATALOG 42-P

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DEALERS IN PRINCIPAL CITIES

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## "ASSURES OUR EQUIPMENT BEING IN TOP OPERATING CONDITION AT ALL TIMES"

*Says W. J. Sheppard Co.  
Paving, Grading, Excavating  
Chicago*



### Pumps Lubricant Direct from Original Drums — Saves Production Time!

WRITES R. A. Sheppard of the W. J. Sheppard Co., Chicago: "We are writing to advise you of our complete satisfaction with our new Alemite Portable Service Station, which is in constant use at a large defense plant project.

"The fact that the pumps deliver lubricant directly from the original drums assures our lubricant being kept clean at all times. Our men have already noticed a big saving in the time required for lubrication.

"Using these power-operated pumps assures clean, fresh lubricant reaching even the tightest bearings—and flushes out the old, dirty grease, thus assuring longer life for our machinery. In addition to this, our cost records

show that we have made a real reduction in lubricant consumption since this station has been in the field.

"In these days when we are all so busy and when it is of utmost importance to 'Keep 'Em Rolling,' we know that our use of this unit will assure our equipment being in top operating condition at all times!"

Alemite Portable Service Stations are available for use with 400-lb. or 100-lb. drums, in standard models, or custom-built to your own specific needs. Write for FREE booklet giving complete details!



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# New Traveling Plant Built Runway Faster

**International Cementers,  
Uses Automatic Spreader  
For Cement on Airport  
Project on Pacific Coast**

(Photos on pages 1 and 52)

† WITH the ever-increasing demand for speed in airport construction, each new device or method which provides faster work with the same excellence of execution is worthy of record. International Cementers, Inc., of Long Beach, Calif., has made rapid strides in improving soil-cement stabilization by the development of a two-wheeled bulk-cement spreader which delivers the cement at a uniform speed from semi-trailer bulk-cement trucks having a capacity of 56,400 pounds of cement, or 600 bags.

One of the most recent jobs performed with this equipment consisted of producing a cement-stabilized base for an area of 125,403 square yards of runway, taxiway and hangar aprons. Soil studies showed that some aggregate would have to be hauled in to furnish the proper gradation for the 6-inch cement-treated base. This imported material was spread uniformly over the area to be treated.

The advantages of the method employed for handling the cement are three-fold: First, there is less waste in the use of bulk cement, it being found that about 1/2 pound per bag is usually not recovered when the bags are shaken; second, the weather hazard when bags must be spread out so far ahead of the mixing; and three, the much greater speed and uniformity of spreading. The estimated amount of cement required was 63,479 bags and actually 63,715 bags were used, an excess of 0.37 per cent.

## Cement Spreading

The bulk cement was delivered by the cement plant in box cars at a siding 5 miles from the job and stored in a portable silo, from which it was loaded into the 600-bag bulk-cement semi-trailer trucks. The loads were kept below 500 bags each because of traction at the job. The entire volume of cement was moved to the job in 130 loads, requiring a 10-mile round trip. Rail haul saved much valuable rubber by shortening the truck hauls.

Each hauling truck is equipped with two screw conveyors at the bottom which deliver the cement to the hopper of the 2-wheel spreader unit towed by the cement truck. A revolving drum, with a horizontal axis, spreads the cement 3 feet wide and of uniform thickness which may be varied as required for each job. On this airport job, the bulk cement was spread at the rate of 36.5 pounds per linear foot 3 feet wide.

## The Mixing

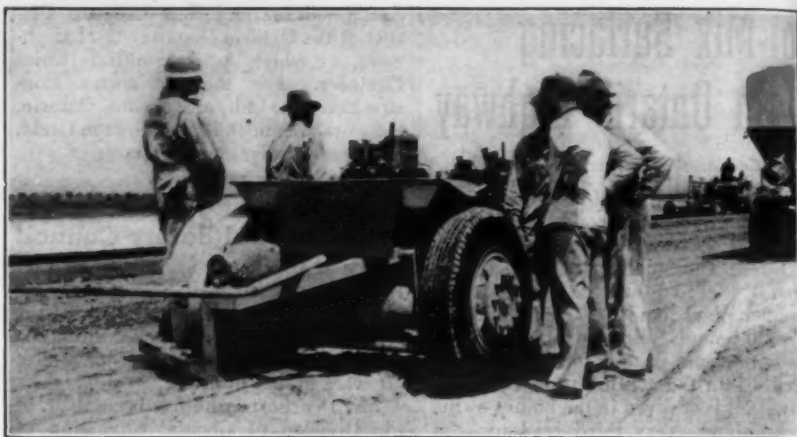
The mixing operation was divided, as is customary, into the dry and wet mixing stages. Immediately behind the spreader, which spotted sufficient cement in the 3-foot band to stabilize a strip 7 feet wide and 6 inches deep, a spring-tooth harrow gave the materials an initial vertical mixing. This was followed by three traveling Gardner mixers, the first of which completed the dry mixing, the second started the wet mixing and applied all of the water required, while the third completed the mixing operations. The mixing of the entire 125,403 square yards was completed in 56 hours working time.

The completion of the work followed the usual procedure of spreading the

mixed material, rolling, top scarifying, respreading, and final rolling.

## Labor Required

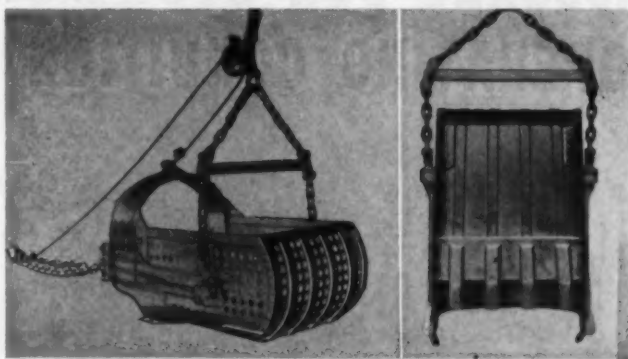
In sharp contrast to the hand methods of spreading cement, used on so many jobs, either direct from the cement sacks or using bulk cement distributed from metal baskets, which requires a regiment of labor, the cement on this job was spread in 86 hours, using 12 men per shift. It is estimated that 60 men, working in two 8-hour shifts plus 12 truck drivers to provide for the arrival of a truck every 20 minutes, would have been required to maintain the same speed using conventional methods of cement spreading. This job used the three semi-trailer bulk-cement trucks and a total of 12 men per shift.



The 2-wheel spreader for delivering a measured quantity of bulk cement per foot of travel, used by International Cementers in the construction of a soil-cement runway base at a western airport.

In the interest of national security, the location and mention of personnel connected with airport construction is omitted.

*This is your war, and your scrap can help to win it! Turn in your old scrap metal today.*



# HENDRIX

*Lightweight* DRAGLINE BUCKETS

**DE SOTO FOUNDRY, INC.**

MANSFIELD, LOUISIANA, U. S. A.

## Compare these advantages!

HENDRIX Lightweight Dragline Buckets are built tough from the ground up. Nothing has been spared to give them longer life and greater strength—yet designed to make them the lightest weight bucket on the market.

Take a moment and check these HENDRIX features:

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- Light weight thus more pay load.
- Reversible Manganese Steel tooth points.
- Heavy reinforcing ribs on bottom and curved back.
- One-piece hitch plate and hoist trunnion.
- Perforated with round holes, eliminating breaks that occur in square holes or lattice construction.
- Perfectly balanced to load faster and dump quicker.
- All-welded construction throughout, no rivets to work loose.

Make a fair and unbiased comparison with any other bucket, and we feel sure your selection will be HENDRIX. All sizes from 3/8 to 20 cubic yards are available in 3 types.

## Renewable TRACTOR RIMS



These wear-resisting, heat treated steel rims are easily installed, at lower cost, on the original tractor wheels, conserving needed war metal. Welding instructions furnished. Write for bulletin.

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sprockets and  
idler wheels

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A 6 x 4 x 32-foot quadruple Laminex culvert in Kansas.

### Pressure-Creosoted Drainage Structures

Laminex culverts are patented structures made of pressure-creosoted wood members fabricated and assembled with exclusive interlocking features and are easily installed with unskilled labor. Adaptable to all service conditions and finished in all needed sizes, Laminex culverts are permanent, strong and durable, and will not rot, rust, crumble or corrode, it is stated.

Individual members of carefully graded structural lumber are framed, pressure-creosoted and assembled with special nails into flat laminated sections up to 4 feet long. The side, top and bottom sections interlock securely, forming a solid unified assembly without the use of hardware. The manufacturer states that the interlocking corner design is one of the features of Laminex culverts, every member in the side sections having a bearing surface for every top and bottom member, thus insuring maximum strength.

Standard Laminex culverts have sloping headwalls, parapets, and underground curtain walls at both ends of the culvert. The sloping headwalls conform to the graded contour of the embankment, prevent erosion and improve the appearance of the culvert. The parapet retains the highway shoulder, while the underground curtain walls prevent backwash and underflow.

Further information on Laminex culverts is contained in an 8-page illustrated booklet, copies of which may be secured by Federal, state and county engineers direct from the Wood Preserving Division, Koppers Co., Koppers Bldg., Pittsburgh, Pa., by mentioning this magazine.

### New Ocean-To-Amazon Motor Highway in Peru

Peru's new trans-Andean ocean-to-Amazon highway which is nearing completion sets several records in altitude, abruptness of ascent and difficulties overcome in its construction. In its first 85 miles, this highway, which will connect the Pacific Ocean with the headwaters of the mighty Amazon River, rises to a height of 16,000 feet, and crosses the Anticona Pass at an altitude of 16,127 feet, higher than the highest mountain peak in Europe or in the United States.

The first section of this highway, extending from Callao on the Pacific

this road eastward, across the intervening ranges and deep valleys to an eventual terminus on the headwaters of the Amazon at Pucallpa, 530 miles from Lima.

The last 177 miles, now approaching completion, involved the most difficult engineering. Here the Andes consist of high parallel ranges with deep narrow valleys. The last range, as surveyed by airplane, apparently had no break in its 9,000-foot height, so that it seemed necessary to build over it or tunnel through it.

Then old long-forgotten records of an expedition made by a Franciscan missionary in 1757 were consulted and the lost trail, taking them through a canyon, was rediscovered. The highway will pass through this gorge which is 5,600 feet above sea level at one end, is nearly 15 miles long, and has towering walls rising over 4,000 feet. It could not be seen from the air because of dense jungle growth.

A significant phase in the development of this new region, pointed out by

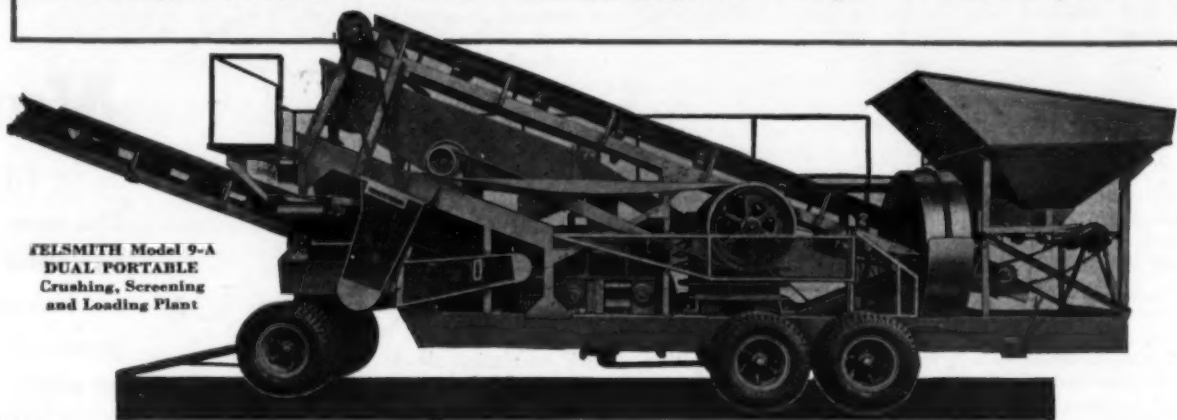
Col. E. E. Valentini, Technical Adviser to the Pan American Highway Confederation, and one which has been largely overlooked in the press of world events, was the discovery of oil two years ago in the vicinity of Pucallpa. With an abundant source of fuel oil for transport here at the headwaters of the Amazon, the industrial development of this vast new region should make great progress.

### Spex for Asphalt Cements

Construction Series No. 64, entitled "Specifications for Asphalt Cements," has recently been issued by The Asphalt Institute, 801 Second Ave., New York City. These specifications should be inserted in the manual "Asphalt Pocket Reference for Highway Engineers" and also in the following Construction Specifications: A-1, A-2, A-3, A-4, B-7, B-8, and CL-1.

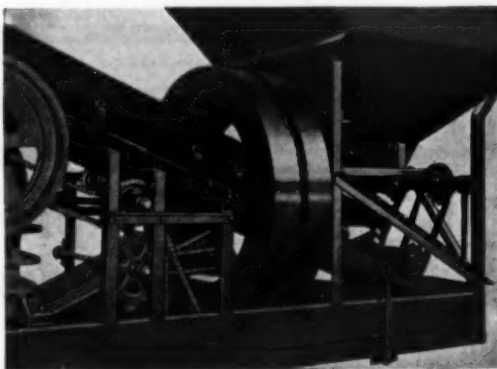
Copies may be secured without charge by writing direct to the Institute and mentioning this item.

## Breaks all records for **QUICK-MOVING** **MONEY-MAKING** on large or small jobs



TELSMITH Model 9-A  
DUAL PORTABLE  
Crushing, Screening  
and Loading Plant

### COMBINES JAW BREAKER AND ROLL CRUSHER WITH AMPLE SCREENING CAPACITY



**ROTARY ELEVATOR CUTS WEIGHT AND BULK**—Developed, used and proved by contractors, the Rotary Elevator makes the Tel Smith Dual most compact, shorter, narrower, easier handled, and gives large capacity.

**DESIGNED FOR ONE-MAN OPERATION**—All clutch and control levers are located at one point on the operator's platform.

**REGULAR TELSMITH COMMERCIAL PLANT UNITS** make up this Dual Portable: 9' x 36" high-speed, all-steel R.B. Jaw Crusher; 36" dia. x 18" wide R.B. Roll Crusher. Crushers are in closed circuit with the highly efficient 3' x 16' R.B. Pulsator with its quick-change screen cloth trays and 2½ decks. Feed Hopper with Grizzly; Rotary Elevator; 4 conveyors (main feed, return, finished material, and reject) all roller chain drive; pneumatic tired Timken R.B. Wheels; Bendix Brakes—are standard equipment. Alternate arrangements of bin loading conveyors and field conveyor with swivel head may be had as extras.

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With its high capacity, a steady stream of gravel pours into the truck (just look at it, in the bottom picture). Minus ¾" gravel at 100 yds. an hour is regular production.

Power economy (a 90-hp. gasoline engine is more than ample) ... the top-notch, less-time-out performance and low upkeep of the Tel Smith standard commercial units comprising it ... plus one-man operation give you much lower yardage costs.

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C. & E. M. Photo  
Vaughan Daggett, Resident Engineer  
for the State, and Raymond Lundgren,  
President of the firm which held the  
contract for a Navy Yard access road.

## Drainage, Rock Work On Access Road Job

(Continued from page 1)

am. The bituminous-concrete areas all rest on an 18-inch gravel base of pit-run material over which is a crushed-stone base 5 inches thick at the center and thickened to 7 inches at the edges. On this was laid a leveling course of 1 inch maximum thickness of sand with 7 per cent of 85 to 100-penetration asphalt. On this the 2-inch bituminous-concrete surface was laid. The center of the circle is 6 inches of loam, seeded, and is protected from the roadway by a concrete curb.

The state-aid road which already has a bituminous surface was paved under this project 20 feet wide for a distance of 150 feet from the traffic circle.

The Kittery Road is paved 22 feet wide with bituminous macadam on an 18-inch gravel base overlaid by the 5 to 7-inch crushed-stone base. The bituminous macadam is a uniform 3-inch surface placed by spreader boxes. The coarse stone has the following specifications: passing a 2-inch screen, 95 to 100 per cent; and passing a 3/4-inch screen, 0 to 15 per cent. This coarse stone has sand broomed in by hand to fill the voids and was rolled by a 10-ton three-wheel roller.

The key stone for filling the surface voids in the coarse stone has the following specification: passing a 3/4-inch screen, 95 to 100 per cent; and passing a 1/2-inch screen, 0 to 15 per cent. The bituminous macadam has a double seal, the specifications requiring a minimum wait of 24 hours between the two seals. Traffic was not permitted to use the road, even though the time amounted to several weeks. The stone chips for sealing were hand-cast from a truck and then hand-broomed for uniform spotting. This stone has the following screen specification: passing a 1/2-inch sieve, 95 to 100 per cent; and passing a No. 4 screen, 0 to 15 per cent.

The penetration asphalt, furnished by the Trimount Oil Co. of Boston, Mass., was a quick-setting asphalt emulsion using asphalt of 100 to 200-penetration and was applied by distributor at a pressure of not less than 20 pounds per square inch. The initial application of penetration asphalt was at the rate of 0.75 to 1.0 gallon per square yard while the second application was at the rate of 1 gallon per square yard. The two seal applications were each at the rate of 0.3 gallon per square yard.

### Drainage

The area in which the traffic circle is located is at the bottom of a natural watershed and is somewhat mucky. For this reason the contractor dug the drainage trenches first so as to insure the driest possible conditions for all of his hauling operations. This work was done by a Lorain 3/4-yard shovel with a backhoe attachment. Considerable water was pumped from these ditches in spite of the fact that this entire section of the country had gone through one of its driest springs in many years. A Marlow

4-inch self-priming centrifugal pump was used to remove all water collecting in the trenches and around culvert construction.

The major drainage structure on the contract is a 3 x 3-foot box culvert 40 feet long which is an extension of the drainage line beneath the junction of the by-pass and U. S. 1. The form work for this culvert, as well as for the underpass, was cut on a Beach saw table powered with a Wisconsin motor. Richmond Screw Anchor Co. ties were used in all concrete construction on this job.

The drainage requirements on this project called for 282 feet of corrugated metal pipe of 12, 15 and 18-inch diameter, 2,162 feet of reinforced-concrete pipe from 12 to 30-inch diameter, and 1,878 feet of 12 to 18-inch vitrified-clay pipe, in addition to 400 feet of underdrain, 11 drop inlets and 7 catch basins.

### Rock Excavation

The rock on the job, while rather poor in character, being a laminated shale, still had to be drilled and blasted throughout the work. Ordinary drilling was taken care of by Gardner-Denver jackhammers operated by two Gardner-Denver truck-mounted air compressors. On one 15-foot rock cut, the shale was drilled with 16-foot steel, using Timken detachable bits in a Gardner-Denver wagon drill. A Worthington 315-cubic foot air compressor mounted on a truck was used to furnish the air for the wagon drill. All holes were blasted with du Pont 40 per cent gelatin dynamite.

The rock excavation was handled by a 1 1/4-yard Bucyrus-Erie shovel with Amsco bucket loading on short hauls to a fleet of two or three GMC trucks. In this work the shovel was aided in cleaning up by an HD-7 Allis-Chalmers tractor with a Baker bulldozer. A Model K Allis-Chalmers tractor with a Baker bulldozer and a Caterpillar D7 with a LaPlant-Choate bulldozer were used on the fills.

The earth and rock excavation along the new right-of-way required demolishing one house, and for the widening of the existing road 20 trees were removed. On the roadway excavation where a comparatively new bituminous-macadam surface was taken up and some 30 inches of subgrade removed, the Bucyrus-Erie shovel was used.

### Borrow and Gravel Base

The 7,000 cubic yards of borrow re-

quired and the 18,500 cubic yards of gravel base course were excavated by the contractor's Lorain 3/4-yard shovel loading to a fleet of nine GMC trucks. The operator kept this shovel moving with swings completed in from 15 to 20 seconds, working it against a face about 8 feet high in the gravel pit.

The rock excavated from the cuts was used in fills, the maximum of which was 14 feet high. The rock was placed in layers not more than 12 inches thick and compacted by a Buffalo-Springfield 14-ton roller, additional compaction being secured from the vibration of the crawler.

(Concluded on next page)



## NEW CATALOG

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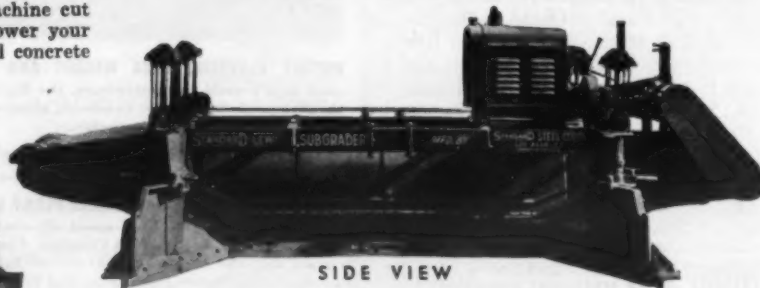
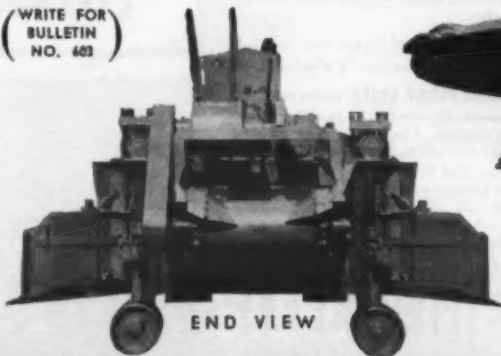
Make YOUR subgrading operations pay a profit:

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One operator and a helper can prepare subgrade with this machine at the lowest cost ever attained.

Not only does the efficiency of this machine cut down subgrading costs, but it will also lower your costs of rough grading, form setting, and concrete or asphalt placing.

(WRITE FOR BULLETIN NO. 403)



SIDE VIEW

And dollar losses due to voids and improper subgrade will be entirely eliminated.

This machine is building most of the airports in the West. Detailed records to substantiate this claim are obtainable from contractors using these subgraders. Write us for further information.

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Los Angeles

C. & E. M. Photo  
A pair of bulldozers removing a

## Access

## Relief

(Continued)

ers of the traffic  
bulldozer.

The major contract for the access road, the work was as follows:

Clearing and grubbing  
Earth excavation  
Rock excavation  
Trees removed  
Structure excavation  
Common borrow  
Gravel base course  
Crushed-stone base  
Bituminous-macadam (emulsified-asphalt method)  
Emulsified asphalt  
Class A concrete  
Class B concrete  
Reinforcing steel  
12-inch corrugated  
15-inch corrugated  
18-inch corrugated  
18-inch asphalt-concrete  
12-inch reinforcement  
15-inch reinforcement  
18-inch reinforcement  
24-inch reinforcement  
30-inch reinforcement  
12-inch vitrified  
15-inch vitrified  
18-inch vitrified  
Drop inlets  
Catch basins  
Hand-laid riprap  
Underdrain  
Underdrain outlet  
Loam  
Sodding  
Gravel overhaul  
Bituminous surface  
Reinforced-concrete  
Reinforced-concrete  
Reinforced-concrete  
6-inch field-stone  
Concrete hand-laid  
Removal of existing  
Sprinkling roads (traffic)

The following underpass

Earth excavation  
Rock excavation  
Backfill  
Concrete roadway  
Concrete retaining  
Concrete in right  
Concrete wearing  
Concrete hand-laid  
Reinforcing steel  
Cement  
Tack coat

In order to save time and money, the contractor's stock shanty office. The into three making it arated. In hand tools

SAN Line 8

Endorsement Building

Level is set  
Special fast  
detachment  
and accurate  
SAND  
4531 Gravel





C. & E. M. Photo  
A pair of Gardner-Denver compressors operating three jackhammers preparatory to removing a ledge in the widening of a section of the new access road at Kittery, Maine.

## Access Road Project Relieves Traffic Jam

(Continued from preceding page)

ers of the tractor as it worked with its bulldozer.

### Major Quantities

The major quantities making up the contract for the construction of this access road, traffic circle and underpass were as follows:

Clearing and grubbing.....	5 acres
Earth excavation.....	18,000 cubic yards
Rock excavation.....	12,500 cubic yards
Trees removed.....	20
Structure excavation.....	1,100 cubic yards
Common borrow.....	7,000 cubic yards
Gravel base course.....	18,500 cubic yards
Crushed-stone base course.....	5,200 cubic yards
Bituminous-macadam surface course (emulsified-asphalt penetration method).....	1,500 cubic yards
Ensilified asphalt.....	50,000 gallons
Class A concrete.....	10 cubic yards
Class B concrete.....	17 cubic yards
Reinforcing steel for concrete structure.....	1,350 pounds
12-inch corrugated metal pipe.....	80 feet
15-inch corrugated metal pipe.....	130 feet
18-inch corrugated metal pipe.....	48 feet
18-inch asphalt-coated corrugated metal pipe.....	24 feet
12-inch reinforced-concrete pipe.....	516 feet
15-inch reinforced-concrete pipe.....	630 feet
18-inch reinforced-concrete pipe.....	736 feet
24-inch reinforced-concrete pipe.....	144 feet
30-inch reinforced-concrete pipe.....	136 feet
12-inch vitrified-clay pipe.....	878 feet
15-inch vitrified-clay pipe.....	300 feet
18-inch vitrified-clay pipe.....	700 feet
Drop inlets.....	11
Catch basins.....	7
Hand-laid riprap.....	10 cubic yards
Underdrain.....	400 feet
Underdrain outlets.....	100 feet
Leaves.....	3,000 cubic yards
Sodding.....	3,000 square yds.
Gravel overhaul (2 miles free haul).....	87,300 yard-miles
Bituminous surface-treated gravel course.....	15,000 square yds.
Reinforced-concrete curb, Type A.....	2,100 feet
Reinforced-concrete curb, Type B.....	1,000 feet
Reinforced-concrete curb, Type C.....	450 feet
Reinforced-concrete curb, Type D.....	400 feet
6-inch field-stone curb.....	500 feet
Cement concrete sidewalk.....	80 square yds.
Removal of existing concrete pavement.....	1,000 square yds.
Sprinkling roadway (dust laying under traffic).....	200 hours

The following items refer solely to the underpass structure:

Earth excavation.....	3,400 cubic yards
Rock excavation.....	1,700 cubic yards
Backfill.....	300 cubic yards
Concrete roadway slab.....	80 cubic yards
Concrete retaining walls.....	230 cubic yards
Concrete in rigid frame.....	685 cubic yards
Concrete wearing surface.....	50 cubic yards
Concrete hand-rail.....	210 feet
Reinforcing steel.....	94,000 pounds
Cement.....	1,550 barrels
Tack coat.....	75 square yds.

### Storage Shed

In order to protect materials in storage, the contractor built a 35 x 15-foot stock shanty adjacent to his timekeeper's office. The storage shed was divided into three parts by heavy hand-rail, making it easier to keep material separated. In the first section were stored hand tools, such as shovels, crowbars

## SAND'S-STEVEN'S Line & Surface LEVEL



Endorsed and Adopted by Road Builders and Contractors

Level is easily and quickly attached to line. Special feature construction prevents accidental detachment from line. Construction is sturdy, and accuracy guaranteed.

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3331 Gratiot Ave. Detroit, Mich.

Anchor Co. tie rods to be used on the underpass and culvert structure. In this section also were stored extra wire rope for the shovels and other heavy parts. In the third section, accessible only from the second door to the shanty, were the drums of Texaco lubricants, including Ursa X30 and X80 oils and Swan-Finch Oil Corp. lubricants. Outside of this shed was the gas pump serviced regularly from the nearby bulk plant of the Texas Co.

### Personnel

The contract for the construction for the Kittery access road, traffic circle and underpass was awarded to Guerini Construction Co., Inc., of Mattapan, Mass., by the Maine State Highway Commission on March 25, 1942, with 135 working days allowed for completion. The low bid on which the contract was awarded amounted to \$182,648.15. Raymond C. Lundgren, President of the contracting organization, acted as Superintendent on this contract.

For the Maine State Highway Com-

mission, Vaughan Daggett was Resident Engineer. From the labor standpoint, the project was carried out under exceedingly difficult conditions because of the scarcity of trained labor due to the demand of New England industries and the Navy Yard itself for trained men. Even untrained labor from the 18 to 20 age group was unavailable.

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### BARTLETT TREE TRIMMERS

Powerful compound lever cutting head has capacity of 1 1/4 in. One-place poles to 16 ft. or sectional poles as required.

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## New heat-proofed STANOLUBE H. D. PROVES VALUABLE AID TO FLEET CONSERVATION FOR INDIANA TRUCK OPERATOR

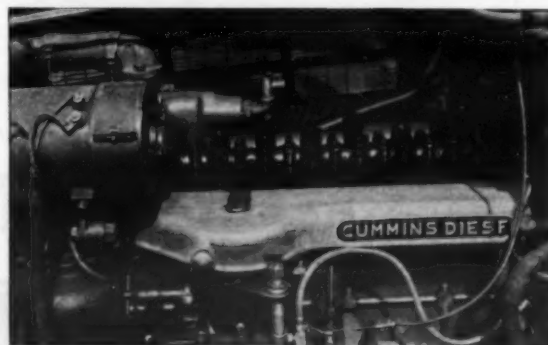
• IN USE just six months, Stanolube H. D., the new heat-resistant, heavy-duty gasoline and Diesel oil, has already eliminated long-standing sludge troubles in the Southern Transportation Company's fleet of Diesels.

Sludge deposits in this fleet had always been troublesome. In December, 1941, one engine was filled with Stanolube H. D. for testing. The picture below shows the valve assembly on this engine after 50,000 miles of operation. There's not a trace of sludge or deposits. Oil consumption has gradually dropped, showing that Stanolube H. D. not only eliminated deposits, but it cleaned and freed piston rings of deposits previously formed.

All Diesels, as well as the heavy duty gasoline tractors in this fleet, have been lubricated with Stanolube H. D. for six months. Not one engine has needed overhauling.

Civilian use of Stanolube H. D. is restricted, but because of the vital need to conserve your type of equipment, it is available to fleet operators. Carbon, varnish, engine deposits—responsible for a large part of your maintenance and short engine life—practically disappear when you use Stanolube H. D.

Let a Standard Automotive Engineer help you with your fleet conservation plans. Make a test of Stanolube H. D. the first step toward reducing maintenance and making equipment last longer.



ALL ENGINES are cleaned regularly on the outside in the Southern Transportation Company's fleet. Now, with Stanolube H. D., engines are clean both inside and out. This is how the test engine looked after 50,000 miles of operation on Stanolube H. D. Not a trace of sludge.



ABOVE: Part of the fleet of Diesel and gasoline tractor trailers operated by the Southern Transportation Company, of Columbus, Indiana. Stanolube H. D. is now helping this company maintain its reputation for frequent, reliable haulage service between Indianapolis and Louisville.

BELOW: F. W. Schildmeier, President of the Southern Transportation Company, (left) and C. L. Brooks, Standard Automotive Engineer at Indianapolis, preparing to examine the test engine after 50,000 miles of operation on Stanolube H. D.



## GET ALL THE FACTS ON HEAT-PROOFED STANOLUBE H. D.

This folder "Beat Heat—Your Engine's Enemy No. 1" tells why modern heavy-duty gasoline and Diesel engines last longer with this heat-proofed oil—tells how it reduces engine deposits that cause high maintenance. Send for a copy. Write Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago, Ill. In Nebraska, write Standard Oil Company of Nebraska at Omaha.



Sign up your fleet in the Office of Defense Transportation's Truck Conservation Corps. Help in this vital war effort by keeping your trucks rolling for the duration.



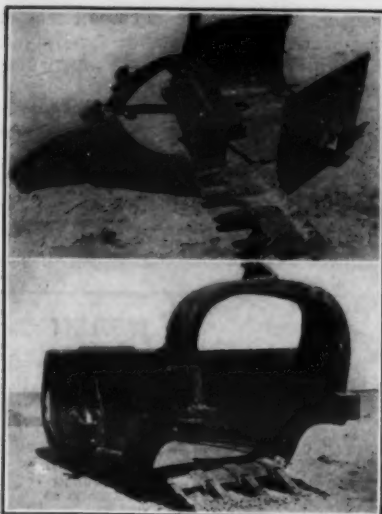
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STANDARD OIL COMPANY (INDIANA)  
AUTOMOTIVE ENGINEERING SERVICE

LOWERS  
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Top, a "sabotaged" dragline bucket stolen and broken up to be sold for scrap; below, the bucket recovered and put together again by welding.

### Unpatriotic Thieves Thwarted by Welding

Even the unpatriotic action of scrap thieves failed to interrupt the construction of a military airport somewhere on the eastern seaboard, because an arc welder was within easy call. To take advantage of the demand for scrap metal, thieves stole a dragline bucket being used on the job, cut it into six pieces, as shown in the upper photo in the illustration, and sold the pieces for scrap. Alert police authorities, however, soon spotted the pieces on a freight car and returned them to the contractor.

A job welder located nearby was called in to make repairs and decided that the bucket, constructed of from  $\frac{1}{4}$  to  $\frac{1}{2}$ -inch mild steel with a manganese steel wearing lip, could be reconstructed easily by welding. First, all parts were "V'd" with an acetylene torch. Then the parts were replaced in their proper position and welded together with 3/16 and  $\frac{1}{4}$ -inch Hobart 77-T electrodes, using a standard Hobart 300-ampere Multi-Range arc welder.

A new dragline bucket of this size would cost around \$375 and would have required weeks for delivery. The repair job by welding required only 10 hours and cost \$90. It is unfortunate that there are people in this country who will stoop to such acts of sabotage and greed, but the fact that the bucket could be restored to service in so short a time is just another example of the contribution which the process of welding is making to the war effort.

### Ransome Changes Name

The Ransome Concrete Machinery Co. of Dunellen, N.J., has changed its name, effective immediately, to the Ransome Machinery Co. No changes in management personnel have been made.

The company will continue to manufacture the same products as in the past, including single and dual-drum concrete pavers, truck mixers, central plant mixers, and a line of small mixers.

### WPB Orders National Equipment Inventory

Under the terms of an order issued on August 31 by the War Production Board, every person, company or governmental agency owning used construction equipment, with the exception of the Army, Navy, Maritime Commission or persons acquiring equipment for export, must register the equipment in their possession with the WPB by September 30.

While other branches of the WPB have previously requested similar information from owners of equipment, this new order (Limitation Order L-196) constitutes the first effort of the WPB to conduct a nationwide equipment inventory on a mandatory basis. The registrations must be made on WPB Form 1159.

In addition to this registration, the order requires that the owner shall notify the WPB within one week after any one of the following: (1) if any used construction equipment is moved from the project on which it is being used; (2) if it becomes idle after completing its work on that project even if not moved; (3) if it is put into use on a project; or (4) if its ownership has changed. Such changes must be reported on WPB Form 1333.

The immediate program contemplates: (1) obtaining and maintaining a complete record of all available used construction equipment in the country; (2) determining the repairs, if any, necessary to put such equipment in usable condition and assist in arranging for such repairs; (3) determining, in conjunction with representatives of the Army, Navy and other governmental agencies, and contractors engaged in governmental construction, the need for construction equipment; and (4) acting as expeditor in the sale or rental of used construction equipment and making recommendations for the assignment of available used construction equipment to those jobs which are most important to the war effort.

Another part of the program contemplates calling of group meetings on pertinent problems relating to used construction machinery, including groups maintaining repair and service facilities, which affect the war effort.

### Traffic Accidents—Why We Have Them

In the introduction to a new book, "Why We Have Automobile Accidents" the author, Harry R. DeSilva, Research Associate, Institute of Human Relations, Yale University, points out that as a nation we Americans dislike regimentation of any sort and that therefore we resist encroachments on our freedom to drive automobiles as we please just as we resent restrictions on our freedom to worship or to vote. As a result, not until the public is properly enlightened and educated on the subject of highway safety will any real progress toward that goal be made.

This book covers the automobile accident problem from a number of aspects, discussing the causes of accidents, pointing out the present status of accident

prevention measures, and indicating what direction more effective steps would take. Gathering highway accident information, the roadway as a factor in accidents, and highway safety planning are other topics covered in this volume which should be of interest to highway engineers as well as traffic engineers. One of the important post-war jobs will be to tackle the serious problem of mounting deaths and damage to property on the highways which is likely to occur particularly as new cars and tires are once more available to this car-dependent country.

Copies of "Why We Have Automobile Accidents" may be secured direct from the publisher, John Wiley & Sons, Inc., 440 Fourth Ave., New York, or from this magazine. Price: \$4.00.

### ASTM Emergency Spex For Portland Cement

In addition to a number of emergency alternate provisions already established in specifications of the American

Society for Testing Materials, an emergency alternate specification has recently been issued for portland cement.

This alternate specification covers three types, I, II, and III, corresponding to the same types in the existing standard C-150. The low heat of hydration type IV and high sulphate resistance type V are not included in the emergency requirements. A number of points of interest are covered in the specifications, providing for the addition of TDA in types I and II in amounts not exceeding 0.045 per cent by weight of the cement and in Type III in amounts not exceeding 0.08 per cent. Vinsol resin may be added to Type I.

Copies of these new alternate specifications may be obtained from the American Society for Testing Materials, 260 So. Broad St., Philadelphia, Penna. Price: 25 cents.

Want information on equipment? Write the Editor.

## PARSONS



### For Speedy, Convenient Trenching

Trees, poles, steep banks and other obstructions won't halt your pipe line digging when you are using a Parsons Trencher with the shiftable offset boom. Excavations may be made with boom in extreme right or left hand position, without sacrifice of speed or ease of operation. With a Parsons you can dig within 14 inches of a side obstruction, and on line with outside edge of either crawler. This one Parsons feature alone will save hours of digging time.

For extra wide trenches, not too deep, dual booms may be effectively used.

For complete details write The Parsons Company, Newton, Iowa

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Position \_\_\_\_\_



# Municipal Airport In South Enlarged

(Continued from page 2)

shovel instead of hand-shoveling as planned. The weather turned quite cool during this period, which also increased the difficulty of handling. The material was spread cold by a Barber-Greene tamping-finishing-spreader in ten parallel 10-foot lanes for the 100-foot width of runway. It was rolled by an 8-ton tandem roller once for breakdown, and then was left for several days while the added flux evaporated. If rolling were continued immediately following the spreading of the material, it would creep badly on the base. The material was spread 1 3/4 inches thick loose for a 1 1/2-inch compacted course. The binder course for the widening and extension of the runways was laid hot, to a thickness of 1 1/4 inches after compaction, using the same Barber-Greene machine which was used for the cold-mix.

## Asphaltic-Limestone Seal

The binder course was given a tack coat of 0.08 gallon per square yard of RC-2 asphalt. The contractor used his own distributor for applying this asphalt, which set in a few hours under the best weather conditions and at times was allowed to cure for two to three days before the 1/2-inch top of Alabama asphaltic limestone was spread. This material, a natural rock asphalt, was mined near Tuscumbia, Ala. It has an average asphalt content of 4 per cent, and after mining is crushed to a maximum 3/8-inch stone size, blended to a uniform mixture, and then 4 per cent more asphalt added and thoroughly mixed. This material was spread by dumping in windrows and then bladed by motor patrols requiring from 10 to 12 trips to secure a uniform 1/2-inch surface. It was then compacted by two traffic rollers, each having eight tires and pulled by a rubber-tired International tractor. This 1/2-inch seal coat completed the runway, there being no liquid seal placed on the asphaltic limestone.

The hot-mix sand-asphaltic limestone seal for the extension of the contract was laid 3/4-inch thick, compacted, using the Barber-Greene machine. Rolling was the same as for the binder.

## Quantities

The original contract price for the work at this airport was approximately \$106,000, and the quantities involved in the contract were as follows:

Excavation .....	29,000 cubic yards
Gravel stabilizer .....	6,100 tons
Prime coat, refined coal tar .....	42,000 gallons

Asphaltic-concrete binder course, cold-laid .....	9,100 tons
Cut-back asphalt tack coat .....	10,200 gallons
Asphaltic-limestone seal, cold-laid .....	3,100 tons
Electric dust .....	1,565 feet

When the contract was extended to include additional paving, the total contract price was increased to approximately \$245,000, and the quantities increased to the following totals:

Excavation .....	139,000 cubic yards
Gravel stabilizer .....	6,100 tons
Coal tar prime .....	64,000 gallons
Asphaltic-concrete binder course, cold-laid .....	9,500 tons
Asphaltic-concrete binder course, hot-mix at airport .....	5,375 tons
Cut-back asphalt tack coat .....	17,000 gallons
Asphaltic limestone surface course (cold-laid) .....	3,100 tons
Sand-asphaltic-limestone surface course (hot-mix) .....	3,225 tons
Fiber conduit, 4-inch .....	3,000 feet
Catch basins .....	12
Reinforced-concrete pipe, 24-inch .....	900 feet
Concrete pipe, 8-inch .....	4,000 feet
Relocate fencing .....	4,000 feet

Extension of the boundary-light system and installation of contact lights were under another contract.

## Personnel

The original contract and extension at this municipal airport in the south was done under the direction of the

United States Engineer Department. The contractor was allowed 135 calendar days for the completion of the extension of the contract.

In the interest of national security, the location and mention of personnel connected with airport construction is omitted.

## Three-Part Hammer For Pulverizer Use

In line with the need for conservation of metals, the feature of the new Clark renewable-tip pulverizer hammer, recently announced by the American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill., is the great saving in weight due to discarded parts.

The hammer consists of a weighted manganese steel head connected to the rotor by two matching arms or bars of manganese steel. On the lower end of each bar are hooks which engage internal pockets in the head. The bars are

bolted together under the eye so that they form a one-piece arm, yet they are easily disengaged from the service worn head by unbolting.

It is claimed that, in addition to the savings in weight, this new hammer design makes it possible to use up two-thirds of the hammer head before renewing is necessary; the time consumed in removing the old and replacing the new head is negligible; no operating stress is imposed on the shank bolt used for assembling; the head can not work loose and come off the arm as long as the latter is on the supporting rotor pin; and no metal is lost by too early discarding of heads, as the maximum use is indicated when lower ends of arms are visible.

It is stated that the combination of this new design plus the known impact and abrasion-resistant qualities of manganese steel provide a maximum service life from Clark pulverizer hammers for all pulverizer and hammermill users.

Further details on these new hammers may be secured from the company.

# DON'T LET THE CLOCK OR THE THERMOMETER CONTROL Your CONCRETING SCHEDULES



## WHEN You CAN CONTROL THEM WITH CALCIUM CHLORIDE

Right now, during the fall months, is the time when concrete construction is particularly tricky. Noon-time temperatures of 60° or above can quickly drop to 50° or less before mid-afternoon. Then concreting slows down or stops for the day—unless means have been taken to compensate for the dropping thermometer.

Just a small quantity of calcium chloride (2 lbs. to the sack of cement) puts concrete in a position to ignore temperature changes and forget the time of day. Pouring of concrete can continue to within an hour of closing time, since the rapid hardening action permits finishing to closely follow placing. Schedules can be stepped up, labor saved, and actual reductions in cost effected.

Research at the National Bureau of Standards shows that plain concrete which acquires safe strength in 3 days at 70 degrees will acquire the same strength in less than 3 days at 40 degrees when 2% calcium chloride is added. Thus calcium chloride more than compensates for the drop from 70° to 40°. And the differences in strength between concrete with and without calcium

chloride are even more marked at temperatures of 32, 25, or even 20 degrees.

Bulletin No. 28, titled "Early Strength Concrete," gives all the data from Bureau of Standards reports, and includes numerous examples of field experience on large and small jobs. Every man who places concrete should have this important manual. Write for it today.

DAYS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
25°																												
32°																												
40°																												
70°																												

Days required for 1:2:4 concrete mix to attain 2000 p.s.i. with and without calcium chloride at various temperatures without cover or protection.

CALCIUM CHLORIDE ASSOCIATION, 4145 Penobscot Bldg., Detroit

# CALCIUM CHLORIDE

SPEEDS YEAR 'ROUND CONCRETE CONSTRUCTION



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in a Hurry!

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75-ton concrete block raised and moved into pit by ten men with Simplex No. 2029 jacks. Barge sections jacked up by six 2029's—three on each side—so flat car could be run underneath. Staging eliminated by using five 2029's to support platform for pouring reinforced concrete sewage tank cover—these are typical stories of the time-saving, labor-saving jobs these and other Simplex Jacks are doing on war construction projects. No. 2029 lifts a full 20-ton 18" on cap or toe lift. Load can't drop. Lifting is on downward or effective stroke. Catalog 41 tells all about these and 5, 10 and 15-ton Simplex Lever Jacks.



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Better, Safer Construction Jacks Since 1899

Simplex  
LEVER SCREW HYDRAULIC  
Jacks



## Avoid Legal Pitfalls

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Edited by A. L. H. STREET, Attorney-at-Law.

### Contractors Are Presumed To Know Their Contracts

A colored minister once prefaced a sermon by saying that he was about to "explain the unexplainable and unscrew the inscrutable." He ought to have made a good public works contractor, because they are often called upon to perform miracles bordering on knowing the unknowable and foreseeing the unforeseeable. This field of endeavor calls for a man with X-ray eyes that can fathom the lowest levels to which excavation is to be made and discover hidden obstructions that will hamper work. Furthermore, the contractor must have the brain of a lawyer who knows more offhand than some judges do after profound study about the power of public officials and boards in connection with public contracts.

The Law is particularly exacting of contractors in that it requires them to know the knowable and foresee the foreseeable. Take, for example, the case of Sager v. State Highway Commission, 160 S. W. 2d, 757, decided by the Missouri Supreme Court. There a road contractor expected that ditching could be done by machinery but hidden stumps made hand labor necessary. He relied upon assurance by assistant engineers on the job that extra compensation would be paid.

The court denied extra pay because (1) the contract not only did not contain any escape clause but provided that the specified price was to constitute full payment despite unforeseen difficulties that might be encountered, (2) an examination of the site would have disclosed its true condition, (3) supervising engineers have no authority to modify contract provisions, and (4) the Missouri Constitution specially forbids payment of compensation beyond that specified in a public contract.

### Compensation Liability To Transferred Employee

An employer can not relieve himself of liability under a contract of employment by transferring the employee to a third party's service, unless the employee knows that he is being transferred and assents.

So a Rhode Island construction company found itself liable for payment of compensation for injury sustained by one of its employees while working for a related company to whose service he had been assigned without his having any reason to suppose that he had a new employer. (Gaspar v. Callan Construction Co., 23 Atl. 2d, 759.) The construction company and a gravel company had the same officers and the former transferred the plaintiff to the gravel company, in whose service he was injured. In deciding that the construction company was liable for payment of an award under the local workmen's compensation act, the Rhode Island Supreme Court observed:

"The principle appears to be well established that, in the absence of special statutory provision, an employer may not transfer his employee's contract of employment to another employer so as to make the latter alone liable under workmen's compensation, unless that employee has expressly or impliedly consented to such transfer."

The court cited decisions of the appellate courts of Massachusetts, New York, New Jersey and Connecticut in support of its holding.

### Was Superintendent Employee or Partner?

Two cases—one from Texas and one from Georgia—involved legal questions concerning the status of a contractor's construction superintendent, where he was engaged on a weekly salary basis, plus a share of the net profits on jobs.

In the Texas case—Brown v. Neyland, 161 S. W. 2d, 833—the Texas Court of Civil Appeals at Austin decided that the superintendent was not a partner, but an employee. The most important factor of the decision was that the superintendent was not a party to the construction contracts. The court treated his interest in the profits as a mere basis for computing compensation for his services. But he was declared to be entitled to an accounting by his employers to determine the amount of profits to be shared by him. In that accounting, the employers were upheld in their claim of right to have overhead expense deducted from gross profits in determining the net, with an allocation of such expense to the jobs in which the superintendent was interested.

In the Georgia case—Lewis v. Huiet, 20 S. E. 2d, 201—a superintendent working on a similar basis was decided by the Georgia Court of Appeals to be an employee, and not a partner, and therefore entitled to unemployment compensation. There the court stressed the facts that the superintendent did not share losses of the business and that he was subject to control by the contractor as indicating an employment relationship.

### Warning Signs on Road Jobs

Using the minimum care required by law to guard against injuring others will not necessarily keep the contractor out of court. Dividends in the form of escape from litigation is apt to reward one for using more care than is strictly required. This applies particularly to the maintenance of warning signs on roads under construction but open to travel. Midway between a slipshod barrier that may collapse or be easily removed and the stationing of a man to warn travelers orally are reasonable standards of care that will vary somewhat according to the particular condition of the road, volume of traffic, etc.

But that one may have to prove to the satisfaction of a court that he has used due care is shown by the case of Nail v. Dunn Construction Co. (7 So. 2d, 884) decided by the Mississippi Supreme Court.

The construction company put up a "Slow" sign 600 feet ahead of a T junction formed by a road under construction and an old highway. About 300 feet beyond was a "Danger" sign. At the junction was a barrier with a red intermittent electric light on it. Despite these warnings erected by the contractor, a car was wrecked at the junction. A trial judge and jury allowed \$1,500 damages against the company, but the Supreme Court set it aside, on the ground that the evidence showed that if the warnings above mentioned were not visible at the time of the accident it was not the fault of the contractor. (The "Slow" and "Danger" sign were found to be intact shortly after the accident, but the barrier had been knocked down.) The Supreme Court said that there was nothing to show that circumstances required the contractor to maintain daily, bi-daily or tri-daily inspection of the signs.

### Sales Tax on Concrete?

The Michigan sales-tax provisions directed against "sales at retail" do not apply to the dumping of wet concrete into forms on construction jobs, holds the Supreme Court of that state. (Metzen v. Brown, 3 N. W. 2d,

870.)

The plaintiff, engaged in supplying wet mixed concrete to general contractors, contested the state taxing authorities' right to impose a sales tax. The controversy turned upon the meaning of the Michigan statute, which defines a taxable "sale at retail" but exempts "tangible personal property permanently affixed and becoming a structural part of real estate."

With two of the justices of the Supreme Court dissenting, the majority decided that the case was governed by the rule declared in the case of Acorn Iron Works v. State Board of Tax Administration, 295 Mich. 143, 294 N. W. 126. In the latter case the court decided that structural steel not sold "over the counter," but fabricated to fit plans and specifications was not subject to the sales tax statutes of Michigan, as being sold at retail.

The court said: "As bearing upon plaintiff's liability for payment of a sales tax, there appears to be no material difference whether plaintiff's construction contract with an owner or a contract builder was for a lump sum or on a time and material basis. In either case, the amount plaintiff charged for performance of its contract must have been based upon the cost or value of materials used as one item and the cost of labor as the other, and in each instance the profit essential to successful conduct of business probably was added."

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To widen a road in 80-ft. poles, carrying power and telephone lines, had to be moved five feet. This earth-boring machine was designed and powered to do it and did—pulled out pole, bored new hole, re-set pole in new hole and moved to next location—all in six minutes! Thus transportation is speeded... communication kept free of interruption... victory hastened... by the co-operation of truck-builder, truck user and Waukesha engineers and engine builders.



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ROLLED STEEL CONSTRUCTION  
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### Free Buttons for Those Who Sign Truck Pledge

As a further aid in the national program of truck conservation being sponsored by the Office of Defense Transportation, Mack Trucks, Inc., 48th Ave. & 34th St., Long Island City, N. Y., is offering free buttons to all drivers and mechanics who sign the U. S. Truck Conservation Corps pledge.

In these pledges now being issued by ODT, drivers and mechanics declare their intention to prolong the life of trucks entrusted to their care by seeing that all minor adjustments and repairs are promptly taken care of, and by co-operating in the national preventive maintenance program now under way.

Copies of the pledge can be secured personally or by mail from any Mack branch and once it is signed, the Mack company will furnish free to the signer a button identifying him as a member of the U. S. Truck Conservation Corps.

The button, illustrated above, is 1½ inches in diameter and is attractively designed in red, white and blue.

### Concrete Paving Joints

A new illustrated booklet entitled "Protect the Joints—Insure the Paving," just issued by the W. S. Godwin Co., Inc., Race & McComas Sts., Baltimore, Md., contains a very complete discussion of the action of expansion joints in concrete paving, of proper expansion and contraction-joint assemblies, of the purpose of dowels, and other phases of the use of joints in paving, as well as data on Godwin self-aligning expansion and contraction joints. Over 180,000 feet of these expansion-joint assemblies were used in the Belt Parkway, New York City. Godwin joints were also used in the construction of the Merritt Parkway in Connecticut and the approaches to the Bronx Whitestone Bridge, New York

City and have been installed on many state highways.

Copies of this booklet A-42 may be secured by interested contractors and engineers direct from the manufacturer.

### Membrane-Type Agent For Curing Concrete

The development of Aquastatic concrete curing compounds was the result of basic research on curing methods in 1938 at the instigation of engineers and concrete technicians responsible for a program of navigation and flood-control design and construction, in order to produce a clear curing compound which, when applied in one coat, would provide a continuous, uniform, effective water-impervious membrane.

Other specifications required that the compound immediately and effectively seal the concrete against surface hydration, and provide maximum retention of the original mixing water; prevent dilution of the water-cement ratio at the surface; offer increased resistance to surface cracking by providing for a continuation of the curing effect beyond the standard 14-day period; produce concrete having compressive and flexural strengths and erosion and abrasion resistance equal to water curing; adhere integrally to the concrete surface without chemical reaction and not peel, but gradually oxidize and erode, leaving a natural concrete surface.

To meet these specifications, the Aquastatic curing compounds were developed, and include Aquastatic Clear, a colorless and transparent compound; Aquastatic White, for application to thin sections of concrete, such as canal linings, where it is desired to maintain high reflectivity in order to decrease cracking of the concrete attributable to large temperature variations resulting from solar absorption; and Aquastatic Black, for surfaces not exposed to direct sunlight. For jobs where it is desired to have a color in the compound in order to facilitate inspection to insure uniformity in spraying, there is also a colored Aquastatic from which the color fades a short time after its application.

An interesting 12-page booklet "Insurance for Concrete," which not only gives in detail the facts about the development of Aquastatic and its features, but also contains valuable information and technical data on the im-

portant subject of concrete curing, may be secured by interested contractors and engineers direct from the Solvents & Plastics Co., 8032 Forsythe Blvd., St. Louis, Mo., by mentioning this item.

Get in the scrap! Search your yards and shops for scrap steel and iron and put it to work for Victory!

### Ryder of Hayward Dies

Harold C. Ryder, Advertising and Sales Promotion Manager of The Hayward Co., New York City, was stricken with a heart attack on August 15 and died almost immediately. Mr. Ryder had been associated with Hayward since 1907.

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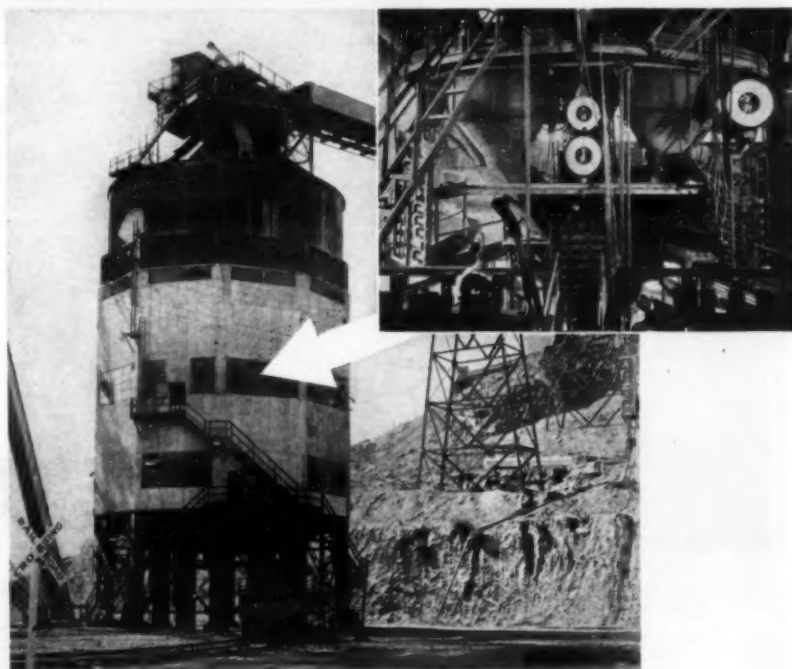
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**BATCHER PLANTS**

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Hand puddling methods are no match for this all-purpose, 9-job MALL Vibrator that will place a stiffer mix faster with important savings in cement, sand, water, and labor. MALL Vibrated concrete assures a better bond with reinforcement; it is free from honey combs and voids; it permits an earlier stripping of forms and makes a stronger, watertight job.

Eight other quickly interchangeable tools, for Concrete Surfacing, Pumping, Sanding, Wire Brushing, Sawing with Circular Saw, Drilling, Grinding and Sharpening Tools—make this easily portable unit easy to keep busy.

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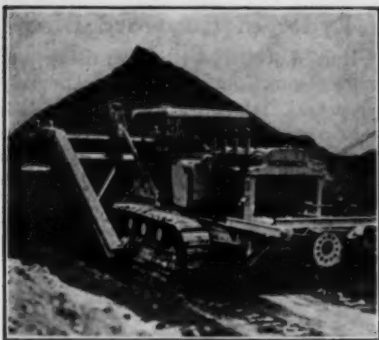
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"THROW  
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INTO  
THE FIGHT"  
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A pioneer—an Allis-Chalmers tractor owned by Henry J. Kaiser in 1929 and converted to a diesel unit by the addition of an Atlas diesel engine.

### Kaiser Also Pioneered In Use of Diesel Power

Today, with the name of Henry J. Kaiser on everyone's lips because of the outstanding success of his shipbuilding program and his plans for the production of cargo flying ships, it is interest-

ing to note that pioneering is nothing new for Mr. Kaiser.

With so much of present-day construction equipment diesel-powered, it is difficult to remember the days when the use of diesels constituted pioneering. As might be expected, however, Henry J. Kaiser, contractor, was one of those pioneers. As long ago as 1929, the Kaiser Paving Co., one of the many Kaiser organizations, in cooperation with the Allis-Chalmers Mfg. Co., converted four of its Allis-Chalmers Monarch gasoline tractors to diesel units by the addition of an Atlas diesel engine, and thus became one of the pioneers in the use of diesel power on construction jobs.

Today Mr. Kaiser is one of the country's largest users of construction equipment, all operated by the type of power he helped to pioneer.

*Have you instituted the Payroll Savings Plan for the purchase of War Bonds in your organization or highway department? If not, start it today!*

### Universal Power Dealer For Krembs Welding Rods

Krembs & Co., Chicago, Ill., has appointed the Universal Power Corp., Cleveland, Ohio, as its stocking distributor of Fluxine fluxes and Kop-R-Arc welding rods and other Krembs welding products in the Cleveland area, embracing all of northern Ohio. A. Leslie Pfeil, President of Universal Power Corp., states that his company is making arrangements for dealers throughout the area to be serviced from Cleveland.

### New Bulletin on Trenchers

Aware of the demand for trenching machinery these days for new pipe lines, drainage projects, army camps, etc., the Buckeye Traction Ditcher Co., Findlay, Ohio, has just issued a new bulletin devoted to its Model 12 trencher. According to the manufacturer, the Model 12 wheel-type trencher is fast, rugged and economical. It digs a straight-sided round-bottom trench up to 24 inches

wide and 5 feet 6 inches deep in any soil. Because of its compactness and maneuverability, it can operate in cramped quarters when necessary. With a bearing area of only 6 pounds per square inch, it can travel on soft ground; yet it has sufficient weight and stability to insure proper traction even on hillsides.

A number of special features are fully described in this illustrated bulletin, No. 7426-M, and specifications are given.

### THE MOST IMPORTANT UNIT FOR AIRPORT RUNWAY CONSTRUCTION



Wherever there is mixed-in-place construction such as soil-cement, bituminous, etc.



### IT DOES THE JOB THOROUGHLY, RAPIDLY, AND ECONOMICALLY

The AGGMIXER operates with other general purpose road equipment—from power take-off shaft of any suitable tractor—easy and safe to operate. The swirling chopping action of the AGGMIXER tines does a thorough job of mixing—wet or dry. Illustrations above show use on airport runway construction. Send for job facts now.

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No history of this conflict will be complete without the story of machinery's part in the war effort . . . an amazing story of valiant services rendered on all fronts. With all our facilities directed to war-production schedules, Galion is happy that its machines can help in hastening Victory. Big, heavy-duty rollers and graders are functioning on necessary construction projects at the same rigorous pace for which they were designed.

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## Britain Keeps Trucks In Service; Here's How

Use of Welding and Ingenuity in Repair and Reuse of Worn Parts Maintain British Road Transport

✦ AFTER nearly three years of war, most of Great Britain's trucks and buses are still running, despite far less ample supplies of spare parts than operators had at their command in this country when it entered the war and despite the fact that many vehicles and stores of parts were destroyed in air raids.

In the belief that some knowledge of how this has been accomplished would be of real value to truck and bus operators in this country, the Transportation and Maintenance Activity Section of the Society of Automotive Engineers made a study of maintenance methods being used in England. This study to further the preventive maintenance program of the Office of Defense Transportation has been approved and distributed by the Vehicle Maintenance Section of the ODT's Division of Motor Transport.

The SAE found that the British have developed many methods for reclaiming and rebuilding available used parts in order to make the most of existing equipment. The salient features of preventive maintenance as used in England follows.

**Pistons.** Pistons are removed at predetermined periods for inspection; worn ring grooves are turned out for over-size-width piston rings; worn or broken ring lands, including the top land in aluminum pistons, are welded solid and re-turned; and skirts are expanded by any one of several American processes. Tin plating has been used to prevent seizure of cast-iron pistons. Badly worn piston pin holes have been bored out and fitted with phosphor bronze bushings and, in some cases, pins have been oversized by chromium plating.

**Crankshafts and Camshafts.** Both chromium plating and metal spraying have been used. Some operators use standard undersizes before building up the crankshaft while others keep the shaft to standard to eliminate the necessity for several undersize bearings. One firm reports that it applies hard-facing to worn cams and then grinds them with a machine of its own design.

**Valves and Valve Mechanism.** Large

valves have been turned down and used to replace those of smaller size. In some cases, valve stems have been brought up to standard size by chromium plating and in others the valve guides have been filled with bronze welding rod and re-bored. Hard-facing is used on valves and has also been successful on valve tappets. Chromium plating has also been used on tappets and on rocker arm shafts.

**Clutches.** Clutch faces on the fly-wheel have been repaired by hard-facing. There is a record of one operator straightening buckled clutch plates by heating them with a gas ring and subjecting them to pressure between two cast-iron plates. Chromium plating has been used on clutch discs; electric welding on toggles levers; and nickel and chromium plating, as well as deposition by electric welding, on transmission shafts and such parts as shifter forks.

**Differential.** Metal spraying has been used to rebuild differential yokes at the surface which holds the differential bearings. This is difficult to machine so that the ring gear remains square with the carrier but it has been done. In some cases these surfaces have been built up by electric welding. Sleeves on the inside of differential cases have been built up by oxy-acetylene welding and then bored out. Spring pads have been built up by electric welding.

**Springs.** Broken main leaves have been converted into intermediate leaves where breakage has occurred adjacent to the spring eye. Shackle pins have been chrome plated. In addition to building them to standard size, this has doubled the life of the pins by providing increased resistance to wear and prevention of rusting. Some pins have been machined down and fitted with undersize bushings.

**Wheels.** Where ball or roller bearings have become loose in front-wheel hubs, bronze welding has been used to build up the internal areas so that they can be re-bored. Some hubs have been chrome or nickel plated.

**Front Axle.** Chrome plating has been used to build up king pins while one operator has machined his king pins down and fitted undersize bushings. Another grinds king pins down to a standard undersize and then builds them up to the regular standard with welding material after subsequent use.

**Axle Shafts.** Axle-shaft splines are built up and filled in with welding, and then are milled into the shaft in such a position that the driving face is of the

parent metal. Splines have also been built up with chromium plating. Keyways are reclaimed by bronze welding.

**Cylinder Heads, Blocks and Crankcases.** Cylinder heads have been salvaged and leaks stopped by welding, metal spraying and cold welding. Welding and cold welding have also been used on cylinder blocks; valve seats have been built up by hard-facing the worn valve seat; and both cast-iron and aluminum crankcases have been successfully welded. Minor cracking of blocks and heads as a result of leaking head gaskets has been cured with bronze welding.

### New Edition of Handbook On Welding Procedure

The Seventh Edition of the "Procedure Handbook of Arc Welding Design and Practice," recently published by the Lincoln Electric Co., Cleveland, Ohio, explains even more fully than previous editions the various methods and techniques used in welding, with a view to

speeding up welding design and engineering and to make it easier for the thousands of men in training to learn the essentials of welding in the shortest possible time. Illustrated more extensively and more clearly than ever before is the chapter on typical applications of arc welding. A great many of these new applications have been developed during the past year in the various fields of war production.

New and important information is given on such subjects as welding symbols, new allowable stresses, preheating for welding, stress relieving, procedures, speeds and costs, Fleet-Fillet technique, general metallurgical characteristics of metals and alloys, weldability of aluminum alloys, tubular construction, appearance and styling of welded design, and many others.

Copies of this Seventh Edition of the Handbook, which contains 1,308 pages and 1,810 illustrations, may be obtained direct from the Lincoln Electric Co. Price: \$1.50 a copy in U.S.A.; elsewhere \$2.00 a copy.

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## Batching and Pouring On N. Y. Paving Job

(Continued from page 23)

### Expansion Joints and Key

The expansion joints were spaced uniformly 90 feet apart, with the exception that no expansion joint in the new pavement was permitted to be placed within 5 feet of an expansion joint in the old pavement. The joints were made up of 3/4-inch asphalt and felt, with six pairs of spade-bar dowels. The bars were at mid-height of the slab and the spade protruded under the expansion material. Three stakes on either side held up the material and an equal-leg cap was used to protect the joint during finishing. The expansion-joint material was divided into lengths of 9 feet and 2 feet, the former being 7 inches high and the latter 9 inches high to take care of the thickened widening strip.

A continuous key was formed in the initial new slab as poured by attaching an oiled wood strip to the inside of the inside form at mid-height. The key form was held in place by a short bolt from the outside which extended through the form and into a heavy nipple. On the other side of the nipple a 9-inch bolt extended out into the concrete. Before the steel road form was stripped the outside bolts were removed and the nipple left in the slab. Then, before pouring the adjacent slab, a 10-inch bolt was screwed into the nipple to give an equal length of tie dowel in each slab. These ties were placed every 5 feet. A crew of three men was kept busy assembling the tie bars and nipples, attaching them and the 1-inch thick wood key forms to the steel road forms, and oiling all of the forms.

### The Batching Plant

The aggregate and cement batching plant was located about 1/2-mile off the east end of the job on a siding of the D L & W Railroad at Big Flats. Two Blaw-Knox aggregate batching plants were required, the first a 3-compartment plant for local sand and the two sizes of gravel specified. This plant was equipped with a Richardson beam scale for weighing the aggregates. Just east of this plant the two stockpiles of coarse aggregates were maintained and west of

it the regular or local sand. Just west of this sand stockpile was the second Blaw-Knox weighing batcher equipped with Howe scales for the Boonville sand, and west of it the stockpile for this imported sand.

A Lorain 40 crane with a 40-foot boom and a 3/4-yard Blaw-Knox clam-shell bucket operated between the two batching plants and the railroad siding, and was able to maintain adequate service for both batching plants, unloading from 5 to 7 cars a day with two clean-up men in the cars to spot the bucket.

The 3-batch trucks backed first under the larger batching plant, receiving the local sand and two sizes of gravel in the two rear compartments and the two sizes of gravel only in the compartment next to the cab. They then pulled out and backed under the smaller batching plant while the batch man paraded across a catwalk and the truck then received Boonville sand in the forward compartment. By this arrangement the truck delivered to the paver 2 batches made up with local sand, which were poured as the base course, and then the third batch was sufficient to pour the top over the same area.

The following table shows the batch weights for the two types of batches used. The aggregate figures are dry weights.

	BATCH WEIGHTS	
	Bottom Course	Top Course
Local sand.....	1,341 lbs.	—
Boonville sand.....	—	1,330 lbs.
Fine gravel.....	1,002 lbs.	1,002 lbs.
Coarse gravel.....	1,224 lbs.	1,224 lbs.
Portland cement.....	564 lbs.	564 lbs.
Natural cement.....	80 lbs.	80 lbs.
Water.....	31 gals.	31 gals.

A Blaw-Knox bulk-cement plant was set up about 100 yards west of the aggregate batching plant on the same side track. A LeRoi gasoline engine on the platform of the plant operated the winch for the cement scoop in the box cars through an automatic clutch, the screw feeder from the car hopper, and the bucket elevator which raised the cement to the plant bin. The feed from the bin to the weighing batcher was through two screw feeds, both of which were driven by General Electric motors. The first or main feed made up the largest portion of the batch and the second was the dribble feed to make up the final 25 pounds of the batch. Two men were used in the box car to operate the scoop for pulling the cement from the car into the feed hopper.

All batch trucks were covered with tarpaulin on leaving the cement batching plant to prevent cement blowing

from the batches and it also served as an added protection against the frequent thunder showers which occurred during the early part of the work.

### Pouring Concrete

Both the old concrete pavement and the widening strip subgrade were

sprinkled from a hose attached to the paver before pouring. Inasmuch as Route 17 is a heavy-traffic highway across western New York State, it was necessary to maintain traffic through the work at all times. This severely hampered the operation of the batch trucks

(Concluded on next page)



Le Roi Compressor designed to operate on gasoline or butane. Tank in foreground carries extra butane supply.

When you hook your tools onto Le Roi Compressors, you have a combination that really clicks... the only outfit with engine and compressor built by the same manufacturer. Quickly towed to the job, easily moved about on the job. Practical design and rugged construction for con-

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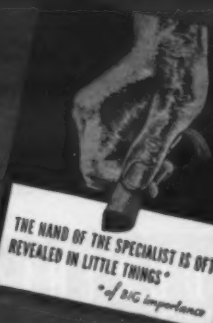


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## New York-U. S. Route Rebuilt and Widened

(Continued from preceding page)

but two experienced flagmen kept traffic in check when batch trucks were maneuvering to drive in between the forms on the old pavement and when the paver was moving ahead, which meant sliding the hose along the section of old pavement which was being used by two-way traffic.

As soon as a batch was dumped into the skip of the Koehring 27-E paver by the skip man, the truck pulled out and the skip was hoisted and given a hammering with a machinist's sledge as the sand and cement showed a tendency to stick to the skip. After a 75-second mixing cycle in the paver drum, the concrete was delivered to the grade where four puddlers shoveled it in to place and then pulled a heavy screed along the forms to strike off the concrete roughly 2½ inches below the top of the steel forms and then placed the tied bar mats. No vibrators were used in the placing of the concrete but one man was occupied full time spading against both forms.

### Finishing and Curing

The first machine-finishing operation was done by a Blaw-Knox Ord 2-screed finishing machine followed immediately by a Koehring longitudinal finisher driven by a Wisconsin motor. For the first several days of operation of this second finisher, considerable concrete was wasted by operating the float only from the low side of the pavement to the high, and pushing concrete over the edge of the forms at each transit of the screed. With a more careful adjustment of the initial finishing machine, the longitudinal finisher was able to operate more economically with a small roll of grout ahead of it and working in both directions across the pavement.

The two hand finishers first used a 9-inch wide belt board, then checked the surface with a 10-foot bow-string straight-edge, cut the edges of the pavement against the forms, pulled the expansion joint caps, broom-finished the surface, and then edged the joints and sides. Curing was done by one man spraying Curcrete over the pavement as soon as the sheen of water had left the

surface.

### Personnel

The contract for the paving of 1.71 miles of U. S. 17 west of Big Flats, N.Y., was awarded to Hornell Construction Co. of Hornell, N.Y., on its bid of \$66,004.40. Throughout the work the operations were in charge of Don L. Scott, Superintendent for the Hornell Construction Co., of which William L. Collins is President. For the New York Department of Public Works, the work was in charge of H. F. Brumm, District Engineer, District 6, with headquarters at Hornell. Dan A. McClellan was Resident Engineer, and J. B. Coughlan, Concrete Inspector.

### Catalog on Band Clamp For Repairing Pipe Lines

Aware of the importance of the conservation of existing pipe-lines and piping, the Dresser Manufacturing Co., Bradford, Penna., announced recently, as an addition to its regular line of repair devices, the Style 77A Band Clamp for the quick repair of small pin holes, leaks, and splits in straight runs of pipe. This clamp is furnished for all standard pipe sizes from 1-inch I.D. to 26-inch O.D., and almost any special or larger size can be made up to order.

A bulletin, Form 423E, describing and illustrating this new band clamp, and giving sizes, specifications and list prices, may be obtained by writing direct to the manufacturer and mentioning this item.

### Tractor Loader Bulletin

A new 4-page folder on the Athey Model 8 Mobiloader, a versatile loading unit for tractor mounting which loads at the front and dumps to the rear, has recently been issued by the Athey Truss Wheel Co., 5631 W. 65th St., Chicago, Ill. This model of the Mobiloader is available in a number of bucket capacities ranging from 2.7 to 4.5 cubic yards and is designed for loading jobs in quarries, sand and gravel plants, batching plants and similar dirt-moving operations. Illustrations in the folder show the Mobiloader in action on a variety of projects.

Copies of this folder may be secured by interested contractors and Federal, state and county engineers direct from the manufacturer by mentioning this magazine.

## Low Wall and Sodding Overcome Bank Slides

(Photos on page 52)

Two interesting cases only a few miles apart on the same highway, U. S. 2 in Vermont, serve to illustrate the benefit of careful roadside planning, while a third is an outstanding example of reduced maintenance costs due to sodding.

Case 1 is a bank about 20 feet high on the south side of U. S. 2 about 3 miles northwest of Montpelier, Vt., identified as Sleepy Lucy Curve. Here, as illustrated on page 52, the bank slips away after heavy rains, making it necessary to send out a truck with two men to dig out the heavy sticky clay which is washed out onto the road. At least 10 to 15 yards of material have to be hauled away each spring and another 10 yards or so during the summer. This work costs about \$50.00 a year in maintenance funds.

Case 2 is a few miles farther from Montpelier on U. S. 2 on the west edge of Plainfield in Vermont. Here you will note a low wall, a natural ground cover and a scattering of pines on the slope, with very little landscaping. The wall is backfilled with gravel with an underdrain to take away the ground water. A cobble gutter between the traveled way and the wall serves to take care of surface water and prevent undercutting of the wall by erosion. This excellent piece of work shows what can be done to make an attractive slope out of one which will slip and slide after each heavy rain, increasing maintenance costs because of the need for removing slippery material from the roadway.

Case 3 is on U. S. 5 south of White River Junction, Vt., and is an excellent example of reduced cost of maintenance due to sodding. When this road was constructed and a wall built at the base, the bank was not sodded at once. Every spring it was necessary to clean up from 25 to 40 yards of clay mud at the foot of the slope. The area was sodded about 4 years ago, the sods being held in place by strips of boards pegged into the slope with stakes 2 to 3 feet long. The boards were placed at right angles to the slope. In the spring of 1942 a slide did occur in an area which had been re-sodded the previous year but where the sods were not pegged.

You may draw your own moral from these three cases. Erosion control is an important wartime highway activity.

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C. & E. M. Photo  
A Koehring 303 crane on the east work trestle of the new Chippewa River Bridge at Durand, Wis., handling steel for the cofferdam for Pier 9. Forms for the footing and first lift of the pier are shown soaking in the foreground.

## New I-Beam and Truss Bridge at Durand, Wis.

(Continued from page 7)

short pier at the east end has eight 21-inch I-beam stringers.

The bridge carries a roadway 27 feet wide between curbs, and has one sidewalk on the downstream side, supported by brackets cantilevered from the outside stringers of the I-beam spans and the vertical posts of the trusses. Due to a 5-degree curve at the west end, the sidewalk has a variable width for the first four spans, the total uniform width being 7 feet 2 inches including the curb. The width of the sidewalk slab for the trusses is 4 feet 9 inches.

The west abutment is an open abutment with two footings. Under each footing are 17 wood piles driven 14 feet to rock by a 3,000-pound Vulcan drop hammer handled with its leads by a Speedcrane. As mentioned above, the east abutment is a box type with flared retaining walls filled with earth, compacted, and then paved with concrete.

The contractor started work at Pier 6, out in the river, by building a sand road out through the shallow water. This was carried eventually to Pier 8. At the start, it was believed that Piers 6 and 5 could be completed before the spring floods, and this proved to be the case, as all of the piers from 6 back to the west abutment were completed without interference and Pier 7 and possibly 8 could have been included because the light fall of snow during the winter of 1940-41 made the spring run-off unusually small. During the short time the job was shut down in April, the sand road out to Pier 6 was lost; but this had been expected and it was replaced as soon as the waters subsided.

### Cofferdams

For Piers 1, 2, and 3 the contractor used a single cofferdam for the footings, while on Pier 4 he used two cofferdams, one for each footing for the columns, driving deep-web Carnegie Type M-116 steel sheet piling. The order in which the work was handled was that the cofferdam for Pier 6 was first driven, then for 4, then 5, then 3, 2, and 1 in order.

The steel sheet piling for the cofferdams was driven by a McKiernan-Terry No. 7 steam hammer; and when pulled a McKiernan-Terry No. 10 extractor was used. When the No. 8 cofferdam was pulled, the extractor was operated with air, using the 25-hp vertical boiler, which had previously furnished steam both for driving the cofferdams and for winter concreting, as an air receiver. A Gardner-Denver 120-foot compressor maintained 100 pounds pressure of air in the boiler, and on one occasion sup-

plied air for two riveting gangs and an air drill. For supplying air to two jackhammers, the compressor was used without the boiler as a reserve receiver. For drilling, the contractor used Chicago Pneumatic bull points, as the rock shattered readily. The rock was removed by a Koehring crane with a 3/4-yard Owen clamshell bucket and a Speedcrane with a 1-yard Erie clamshell bucket. The same two cranes were used when the sheet piling for the cofferdams was driven, allowing about 2 feet clearance between the cofferdams and the neat line of the footings.

The cofferdam for Pier 9 was driven by the same pile driver swung from a Koehring 303 on a work trestle extending from the east bank. There was 4 feet of overburden over the rock at Pier 9, and 8 feet at Pier 8, with none under the working trestle so that the falsework piles were equipped with welded points and toed into the rock 4 to 6 inches.

For excavation and during concreting, the cofferdams for Piers 5, 6, 7, 8 and 9 were unwatered by a 6-inch Gorman-Rupp self-priming pump. A Rex 4-inch self-priming pump and a Jaeger pump were used separately in unwatering the cofferdams for the west abutment and Piers 1, 2, 3 and 4. There were no blows under the sheet piling of any of the cofferdams.

### Pier and Deck Forms

The forms for Piers 1, 2, 3, and 4 were identical, with the exception that Pier 4 columns were slightly larger, so the panels were built first for Pier 4 and then cut down for the other three. The contractor used 1 x 8-inch form lumber with 2 x 6-inch studs spaced 16 inches on centers and 2 x 6's double for wales. The Williams form clamps with 1/2-inch tie rods were spaced 30 inches on centers vertically and horizontally.

The deck forms were unusually simple in construction and very easy to remove after the concrete had set. They consisted of 1 x 8-inch lumber in 16-foot panels nailed to a 1 x 2 so that the lumber would remain tight. These loosely-assembled panels then rested on 2 x 4's transversely between I-beams, and the whole was supported by 2 x 6 jacks running longitudinally with 2 x 4 legs supported by the lower flange of the I-beams. Transverse strips of light material were used as braces across between alternate pairs of legs. To wreck these forms it was necessary only to knock out the braces and then pull the legs to drop the forms. When not in use the pier forms were floated in the river face down to prevent them from drying out.

### Steel Erection

The falsework for the trusses consisted of native timber driven with a penetration of 8 to 10 feet for bearing and using about 30 piles per span with 12 x 12 and 8 x 16 old railroad timbers for caps.

The contractor erected his own steel, using a stiffleg traveler with a 55-foot boom operated by a 2-drum Clyde hoist driven by a Waukesha 6-cylinder 55-hp gasoline engine.

### Concreting

The aggregates for all of the concrete

were supplied by the Eau Claire Sand & Gravel Co., shipped in by rail to a siding at Durand about 1/4 mile from the east end of the bridge. At the siding an Orton & Steinbrenner steam locomotive crane with a 1 1/4-yard Owen clamshell bucket unloaded all of the cars to stockpiles. Because of lack of space, the stockpiles were fairly high and heavily bulkheaded, to separate the sand and

two sizes of gravel. As the contractor had several other jobs working, all of his bins and batching plants were busy, so a hand-labor batching set-up was used, with men shoveling the aggregates to rubber-tired wheelbarrows which were run across a Johnson wheelbarrow scale and then up a ramp and dumped in proper order into two hoppers which, (Concluded on next page)

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## Concreting Methods For Wisconsin Bridge

(Continued from preceding page)

when tripped, delivered the weighed batches into the two compartments of a batch truck. The cement was dumped into the hoppers on top of the aggregate, so that when dumped it was folded into the batch for hauling to the mixer. As there was room for only a very small cement shed, the contractor usually moved the cement direct from the railroad cars through the cement shed and onto the batches during a pour.

For pouring Piers 1 through 6, this batching set-up was placed at the west end of the bridge and the aggregates and cement hauled there for batching.

All concrete for the footings, columns, deck, and abutments was mixed in a Jaeger 14-S 3-bag mixer and delivered to a Heltzel bottom-dump concrete bucket which was swung by one of the cranes to the pier or deck for placing. Concrete was placed in the piers through from two to four hoppers with elephant-trunk chutes, and the concrete vibrated in place by two Mall gas-driven concrete vibrators. A third Mall unit was used for sanding down the forms and for operating a drill.

In order to insure a smooth roadway, the Superintendent developed a heavy screed attached to a Lakewood finishing machine driven by a LeRoi motor. Instead of the usual strike-off, a 3 x 16-inch plank was bolted to the front screed as a strike-off; and because of the added weight the entire screed was pulled ahead by two cables turned up by Sagen hand winches. Following this, a 12-foot hand bullfloat was used, then the deck was straight-edged, belted, and broomed like standard concrete pavement, and then covered with double burlap which was kept wet for four days to insure proper curing.

In spite of the type of batching plant and size of mixer, the contractor was able to make very creditable time on the various pours, the largest of which were 300 cubic yards each for Piers 8 and 9. These required from 16 to 20 hours as the batching plant and mixer produced an average of 14 cubic yards of concrete per hour.

Northwestern portland cement was used throughout the work, except on Piers 4 and 6, where a special high-early-strength cement was used above the footings, as they were poured in winter and it was desired to reduce the time required for operating the heating equipment to maintain the temperature above 40 degrees Fahrenheit. A rather novel system of heating the forms, which were enclosed in tarpaulin, was developed by the Superintendent. Low-pressure steam from the 25-hp vertical boiler was run through Ford engine radiators with a fan behind each one, converting them into unit heaters. Four of these units provided ample distribution of the heat to maintain a uniform temperature for the required time.

### Quantities and Unit Prices

The quantities on which the contractor made his bid, with the unit prices, for the Chippewa River Bridge No. 637 at Durand were as follows:

Item	Quantity	Price
Excavation, structure	3,615 cu. yds.	\$ 6.00
Concrete masonry, bridge	3,618.1 cu. yds.	15.45
Bar steel reinforcement, bridge	228,310 lbs.	0.04
Structural steel	1,862,890 lbs.	0.07
Cast steel	21,680 lbs.	0.18
Steel forgings	3,320 lbs.	0.30
Sheet lead	3,954 lbs.	0.15
Zinc plates	39 lbs.	0.30
Untreated timber piling		
delivered	594 ft.	0.25
untreated timber piling, driven	594 ft.	0.15
Test pile, 25 feet long, driven	1	100.00
Floor drains	46	15.00
Waterproofing	183 sq. ft.	0.10
Lighting system complete	1	1000.00
Removing old bridge	1	2000.00

### Personnel

The contract for the 0.241-mile bridge and approaches on the Ellsworth-Du-

rand road, U. S. 10 and Wisconsin Highway 25, was awarded to Fielding & Shepley, Inc., of St. Paul, Minn., on its bid of \$225,535.45. Throughout the work, Harold Hansen was Superintendent for the contractor, and A. E. Blunt was Resident Engineer for the Wisconsin State Highway Commission.

### Celebrates Anniversary

The Interstate Machinery & Supply Co., Omaha, Nebr., is this year celebrating its 40th anniversary. G. C. Edgerly is Pres. & Gen. Mgr.; D. M. Edgerly, Vice Pres.; and E. J. Fehrs, Secy. & Mgr., Construction Machinery Dept.



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4,800 lbs. Working Load per Rod				7,500 lbs. Working Load per Rod				13,000 lbs. Working Load per Rod			
LENGTH of Rod	Price per 100 Rods	App. Wall Width		LENGTH of Rod	Price per 100 Rods	App. Wall Width		LENGTH of Rod	Price per 100 Rods	App. Wall Width	
12" or less	\$2.06	15" or less		12" or less	\$3.06*	15" or less		12" or less	\$4.06*	15" or less	
13"	2.17	16"		13"	3.25	16"		13"	4.33	16"	
14"	2.33	17"		14"	3.50	17"		14"	4.67	17"	
15"	2.50	18"		15"	3.75	18"		15"	5.00	18"	
16"	2.67	19"		16"	4.00	19"		16"	5.43	19"	
17"	2.83	20"		17"	4.25	20"		17"	5.67	20"	
18"	3.00	21"		18"	4.50	21"		18"	6.00	21"	
19"	3.17	22"		19"	4.75	22"		19"	6.33	22"	
20"	3.33	23"		20"	5.00	23"		20"	6.67	23"	
21"	3.50	24"		21"	5.25	24"		21"	7.00	24"	
22"	3.67	25"		22"	5.50	25"		22"	7.33	25"	
23"	3.83	26"		23"	5.75	26"		23"	7.67	26"	
24"	4.00	27"		24"	6.00	27"		24"	8.00	27"	
Price per add'l inch \$0.0215				Price per add'l inch \$0.0223				Price per add'l inch \$0.0231			
Price per add'l foot \$0.258				Price per add'l foot \$0.276				Price per add'l foot \$0.272			
Price per add'l 100 ft. \$1.80				Price per add'l 100 ft. \$2.76				Price per add'l 100 ft. \$3.72			
Lengths over 20' add for Williams High Tensile Couplings per 100 \$2.75				Lengths over 20' add for Williams High Tensile Couplings per 100 \$3.75				Lengths over 20' add for Williams High Tensile Couplings per 100 \$4.75			

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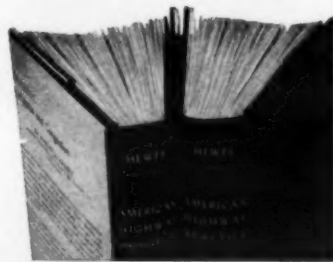
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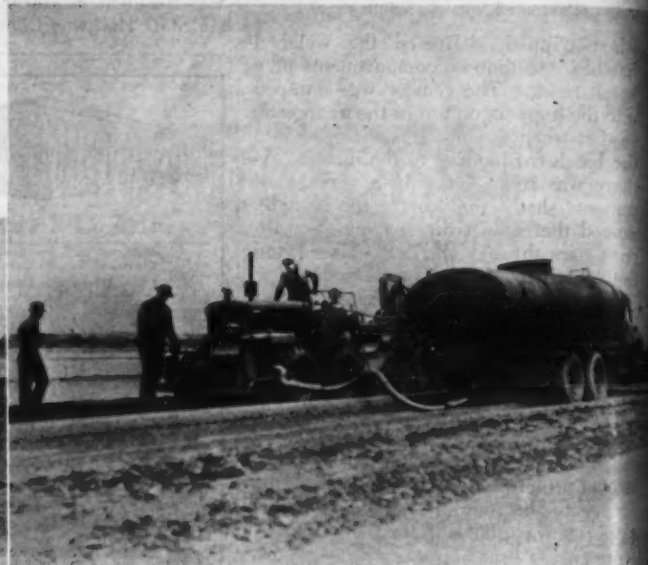
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# Contractors and Engineers Monthly



Scenes on a western airport project. At left, bulk cement for stabilizing runway base was delivered to a portable silo from which it was taken in 600-bag semi-trailers 5 miles to the job. Below, the bulk cement was delivered from the semi-trailer by a pair of screws to a metering spreader, permitting accurate soil-cement proportioning for mixing by the Gardner traveling unit shown at the right. See page 38.



C. & E. M. Photos  
A Waukesha-motor-powered I-B trailer compressor with I-B Jackhammer drilling holes in old concrete pavement for form pins on a highway widening and resurfacing project near Corning, N.Y., for which the Hornell Construction Co. was the contractor. At left, the forms in place, showing the tie dowels for the second slab. See page 23.



A water pump to be used first by the Navy's Seabees in construction of a new base in the South Pacific, will later become part of the base's fire-fighting equipment. See page 35.  
Official U. S. Navy Photo



C. & E. M. Photos  
At a central location on the contract of Guerini Construction Co. for an access road to the Navy Yard at Kittery, Maine, the contractor set up a small storage shed with the three sections shown above. Left, lubricant storage; center, a stock of Richmond Tyscrus for the underpass; and right, miscellaneous storage of hose, lanterns, etc. See Page 1.



Shoveling up a small clay slide at Sleepy Lucy Curve on U. S. 2 near Montpelier, Vermont.  
C. & E. M. Photo



The old and new bridges, the latter under construction at the right, over the Chippewa River at Durand, Wisconsin. See page 7.  
C. & E. M. Photo



Careful treatment of this slope, with low wall, under-drains, and a natural ground cover overcame a bad slide condition similar to that above. See page 49.  
C. & E. M. Photo